TECHNOLOGY DEPT.

NOVEMBER, 1949

Flow

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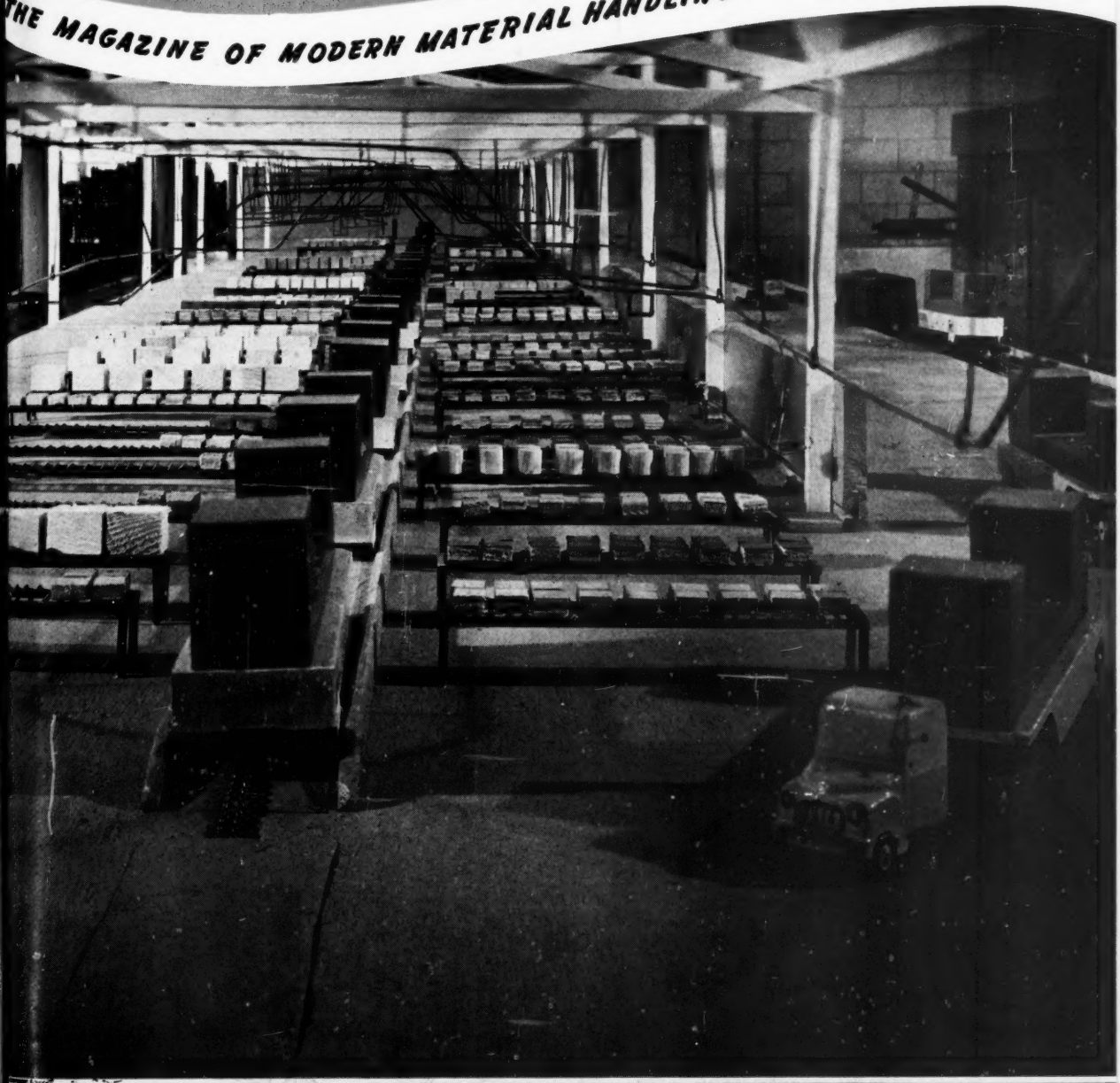
THE MAGAZINE OF MODERN MATERIAL HANDLING AND PACKAGING METHODS



IN THIS ISSUE:

5-Room Homes By Conveyor Flow... Unitizing Paper Bags... Costs Cut From $2.12 to $1.26... Wrap Up a House—In One Package... Flow in a Department Store

LITTLE HOIST BIG VALUE!

Save every time you use it!

Next time you want to cut your departmental costs, think of the Zip! This small electric hoist costs so little — *saves so much* that you can't lose. You press the buttons; the Zip does the rest — with any load up to 2000 lbs.

The Zip-Lift gives you many extras, without extra cost. (Note the Added Values below.) In design, in power, in toughness, in dependability, the Zip adds up to America's finest small hoist — and the greatest small hoist value. That's what makes it the leader it is!

Write for this helpful booklet filled with practical cost-saving ideas. Ask for Bulletin H20-4!

Handle it "thru-the-air" at lower cost

THESE ARE ADDED VALUES!

SAFER — Full magnetic control with current reduced to 110 volts at the push-button. No open wiring. Plugging crane type limit switch and larger double brakes provide maximum safety.

LIFETIME CONSTRUCTION — Precision built — shaved gears running in oil — grease-sealed antifriction bearings — fully enclosed, moisture-proof, dust-proof, acid-proof.

SMOOTHER OPERATION—Motor specifically built for hoist service to withstand frequent reversal. Loads controlled within a fraction of an inch.

ALERT SERVICE — Out-of-stock delivery from qualified dealers everywhere — also backed by 18 branch offices and conveniently located warehouses.

Available in capacities up to 2000 lbs.

P&H ELECTRIC HOISTS

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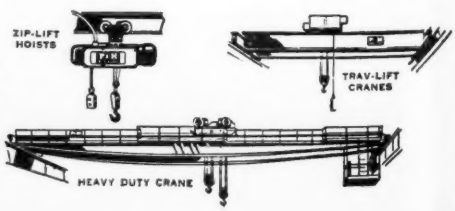
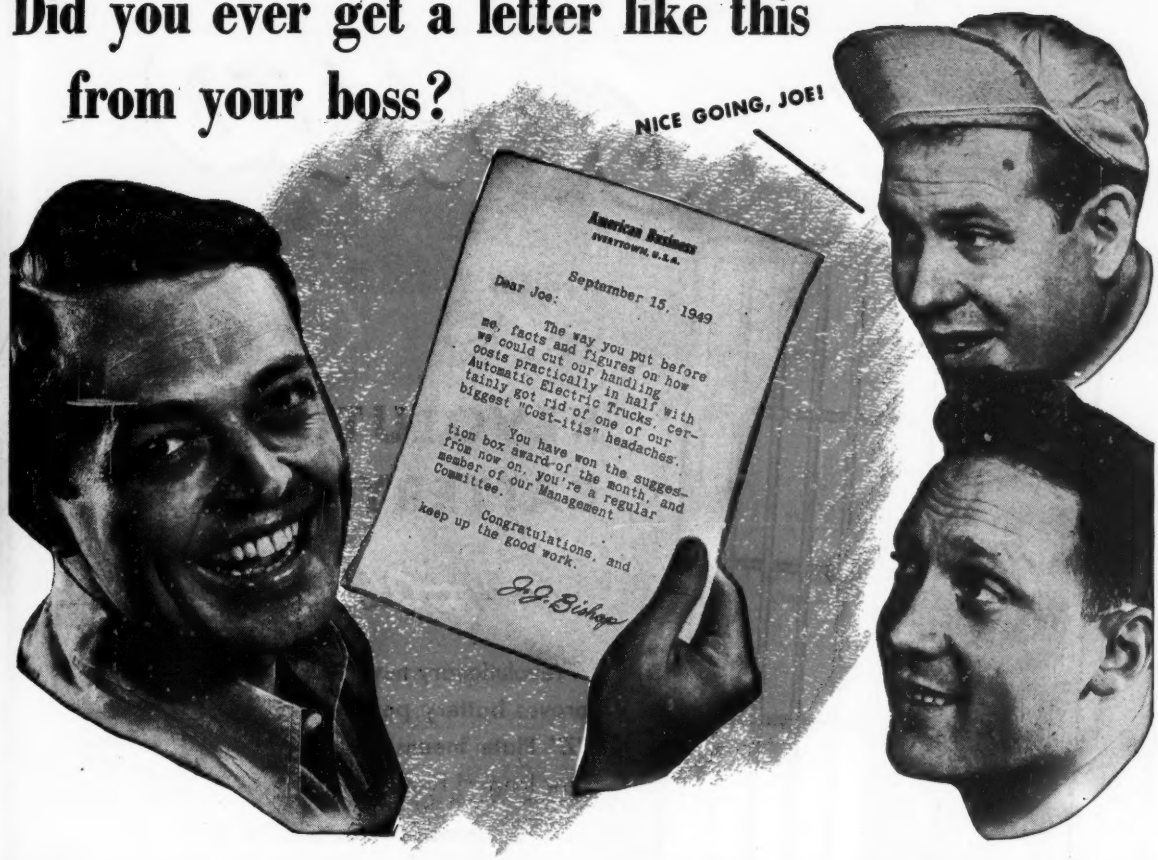
Milwaukee 14, Wis.

HARNISCHFEGER CORPORATION

HOISTS · WELDING ELECTRODES · MOTORS · P&H · EXCAVATORS · ELECTRIC CRANES · ARC WELDERS



Did you ever get a letter like this from your boss?


NICE GOING, JOE!
American Business
OVERTOWN, U.S.A.
September 15, 1949
Dear Joe:
The way you put before me, facts and figures on how we could cut our handling costs practically in half with Automatic Electric Trucks, certainly got rid of one of our biggest "Cost-itis" headaches.
You have won the suggestion box award of the month, and from now on, you're a regular member of our Management Committee.
Congratulations, and keep up the good work.
J. J. Bishop

The pay-off for Joe...he showed the Boss how to cut handling costs in half!

Sure, with prices under pressure, sales declining, profits being squeezed, the boss is apt to say: "*Lay low on capital expenditures.*"

But if you take him at his word, especially when it comes to handling costs, you're not doing him, the business or yourself any good.

Whatever your manual handling costs are now, deduct 50%, and you'll have the cost of handling your products with Automatic Electric Trucks. Imagine what relief *that* would give your boss from his "Cost-itis" headaches.

So get yourself all the facts about these amazing electric trucks and lay them before him. With effortless, easy finger-tip control, they *lift, move* and *stack* hundreds of pounds, or tons and tons of your material so easily, a stenographer could operate them in a breeze.

Yes, these mighty giants of electric power do all the work. One man accomplishes as much as three men doing fatiguing *manual* handling. The other two can be moved to more productive, better paying jobs.

Send the coupon today . . . and when you get all the figures, you can show your boss the thousands and thousands of dollars these electric trucks are saving industry every day, and how *similar savings may be his!*

You'll be rewarded for your interest . . . and you'll be the man he will keep his eye on for the better jobs that are always coming up. Mail the coupon now, and see how fast things start looking up for you!

Automatic
ELECTRIC TRUCKS

TRADE **Automatic** MARK
141 W. 87th St., Dept. W-9, Chicago 20, Ill.

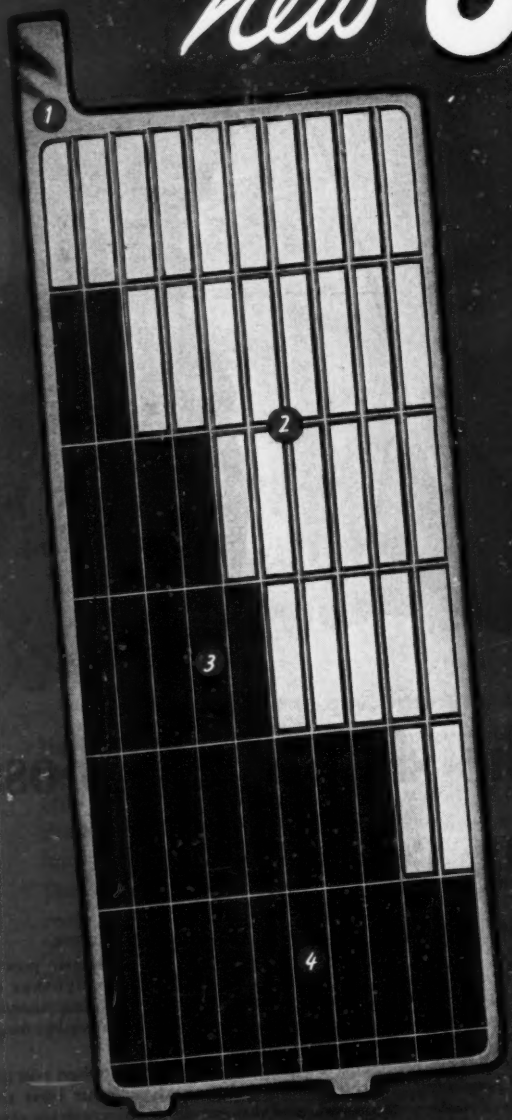
Please send me complete money-saving facts on amazing Automatic Electric Trucks, without obligation.

Company Name.....
By.....Position.....
Street Address.....
City.....Zone.....State.....

New GOULD "Z" Plate

REVOLUTIONIZES BATTERY DESIGN!

Only GOULD Has It!



A revolutionary new plate design greatly improves battery performance. The new Gould "Z" Plate means that Gould batteries stay new longer! Here's why:

1. Solid, non-porous positive grid.
2. All grid members are heavy with same cross section.
3. Regenerative oxide renews itself throughout battery service.
4. More active material per battery pound.

Brand new from Gould's modern laboratories and pilot plant. Available shortly in all "Thirty" and "Kathanode" types. Ask for literature on how Gould's new casting techniques improve battery performance.

The Gould "Thirty"
More than ever—America's
Finest Industrial Truck Battery.

GOULD

STORAGE BATTERY CORPORATION

TRENTON 7, NEW JERSEY

Always Use Gould Automobile and Truck Batteries

Flow

VOL. 5, NO. 2 • NOVEMBER, 1949

IRVING B. HEXTER, Pres.
LESTER P. AURBACH, V. Pres.

All communications should be addressed to FLOW Magazine, 1240 Ontario Street, Cleveland 13, Ohio.

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MANFRED SCHUELER
EDITOR

HENRY F. EATON
Associate Editor

E. J. HEXTER, Director
Circulation Department

•

FLOW EDITORIAL AND BUSINESS OFFICES—

CLEVELAND OFFICE
HAROLD F. BEHM,
1240 Ontario Street
Cleveland 13, Ohio
Phone: Tower 1-0264

NEW YORK OFFICE—
LEE HAAS
60 E. 42nd St.
New York 17, New York
Murray Hill 7-3420

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COVER PHOTO—Dimensional model incorporates proposed changes for Lustron Corporation's load line. Conveyor sections are planned for "mobile" storage of component parts for porcelain enamel homes. See the article "Wrap Up A House—In One Package."

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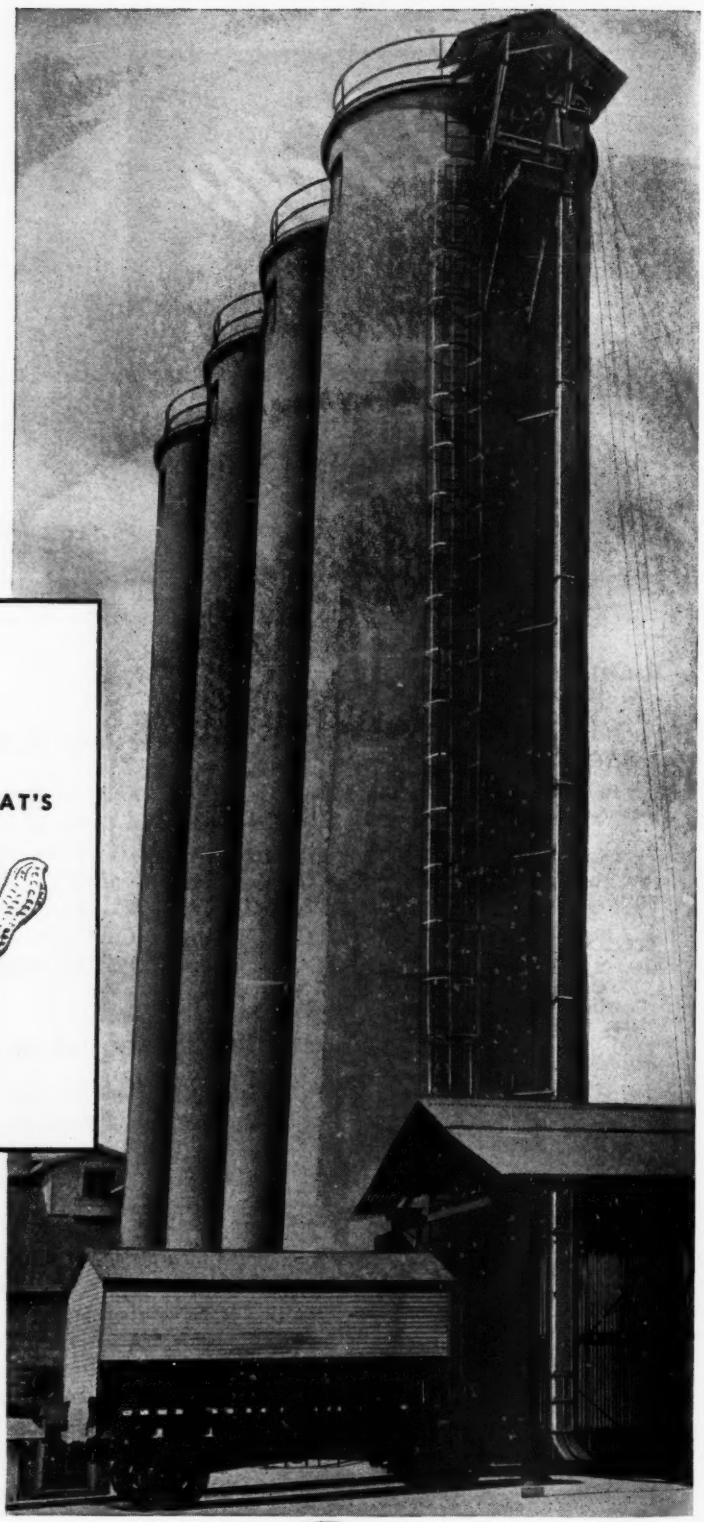
"Acceptance under section 34.64, P. L. and R. authorized at Milwaukee, Wisconsin."

FROM THE S-A RECORD BOOK

Another Example
Another Field
Another Bulk Material



● Moving bulk materials to the right place at the right time and in the right volume is a prime requirement in *any* industry . . . it requires a system designed to operate efficiently at the lowest handling cost per ton.

MANY BESIDES FOOD PROCESSORS COULD USE A BULK HANDLING SYSTEM THAT'S

Working for Peanuts

Stephens-Adamson engineers designed and installed a REDLER handling system to move 22 tons of shelled peanuts per hour to storage without breakage or contamination. Your company may have a similar handling problem . . . or one that's entirely different. The point is, that if your problem involves bulk handling, S-A engineers have the experience and a complete line of equipment to solve it for you.

The record shows that the S-A solution will *materially* reduce handling costs. This service can be invaluable to you . . . and it's yours for the asking. Write us today.

STEPHENS-ADAMSON MFG. CO.

36 Ridgeway Avenue, Aurora, Illinois · Los Angeles, Calif. · Belleville, Ontario

DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

HAVE

ELWELL-PARKER

solve your

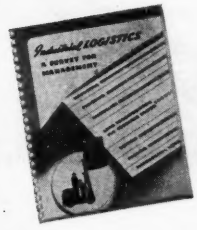
Special

handling problems

Illustrated are just a few examples of E-P *versatility* in meeting unusual requirements. For Elwell-Parker devises special attachments and units where a "standard" truck will not do your job.

These "specials" are a product of Elwell-Parker's *unexcelled* experience gained in the past 42 years while supplying trucks for over 300 different industries. Indeed, owners of mixed fleets usually turn to Elwell-Parker when they have special requirements.

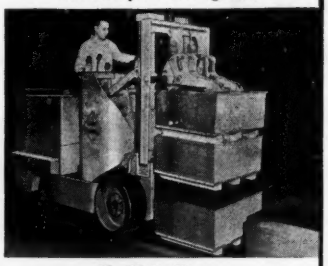
If your materials handling is "different", Elwell-Parker's versatile experience will supply you with trucks *exactly* suited to your needs. The Elwell-Parker Electric Company, 4539 St. Clair Ave., Cleveland 3, O.

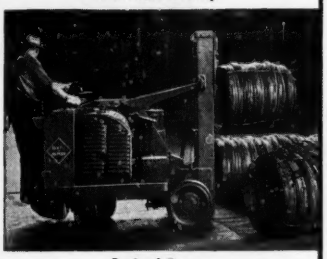


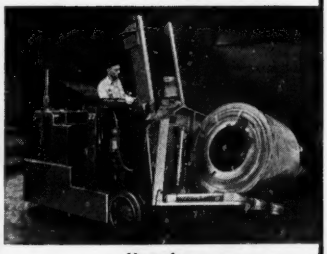
FREE BOOKLET explains Scientific materials handling in your particular industry. Write for it.

ELWELL-PARKER
POWER INDUSTRIAL TRUCKS
Established 1893

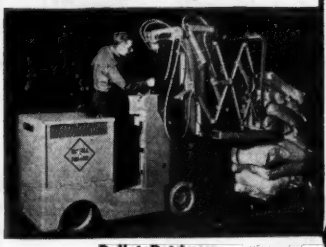
Side Dump Revolving Unit

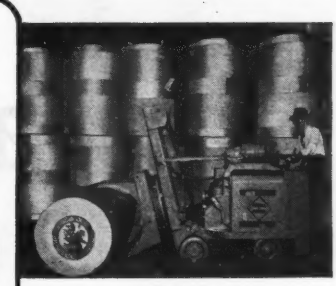

Tin Plate Clamp

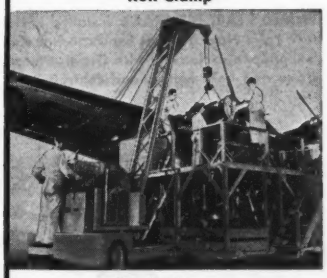

Swivel Ram

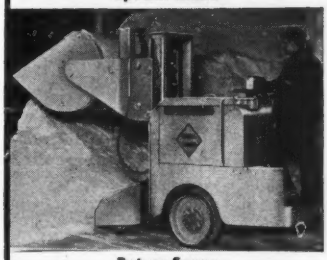

Upender

Bale Clamp

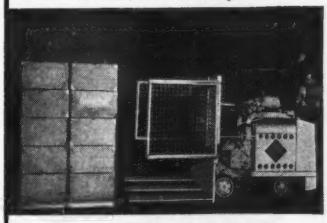

Pallet Retriever


Roll Clamp


Special Crane

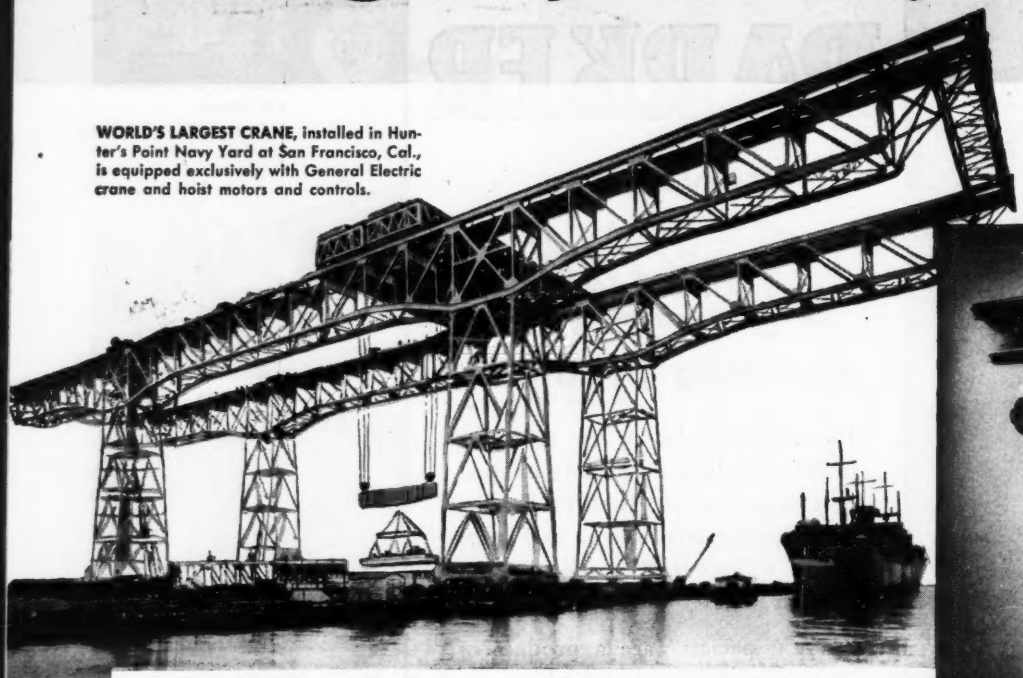

Rotary Scoop

Roll Handler with Apron

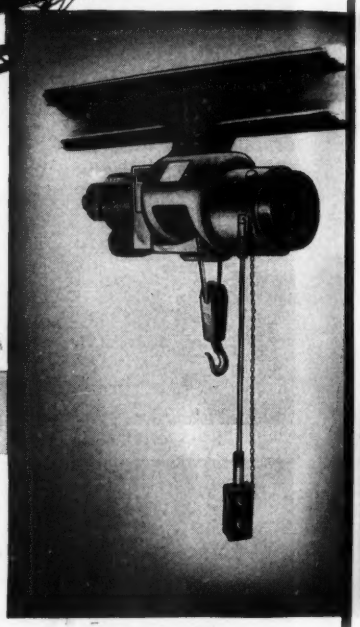

Fork Truck with Side Wings

Die Handler

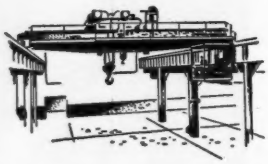
Giant gantry or handy hoist . . .



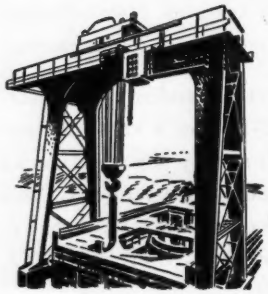
WORLD'S LARGEST CRANE, installed in Hunter's Point Navy Yard at San Francisco, Cal., is equipped exclusively with General Electric crane and hoist motors and controls.



SMALL INEXPENSIVE HOISTS, now being made in ¼, ½ and 1-ton sizes, depend on electric motors and control for speed and efficiency.

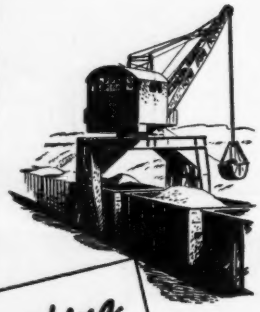


general-purpose crane

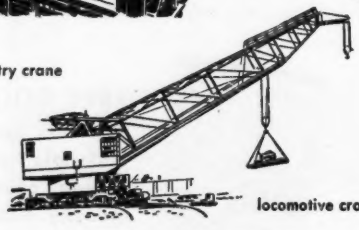


gantry crane

overhead bucket crane



portal crane

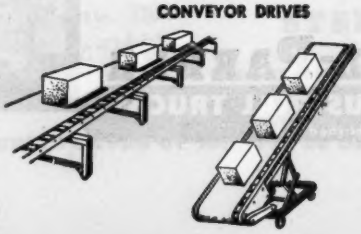


locomotive crane

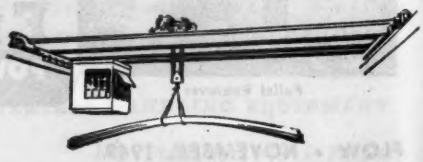
semi-gantry crane

Everything electrical for MATERIALS HANDLING

CONVEYOR DRIVES



CRANE DRIVES



POWERED by G.E.

TO HELP CUT YOUR MATERIALS HANDLING COSTS

As a manufacturer or a user of industrial cranes or hoists, you are concerned with the selection of the right drive for the equipment. General Electric may be able to help increase the performance of your unit, save you money, or both. While a detailed study by our engineers will be needed to show you how much and in what way, here are two facts worth remembering:

FACT #1—General Electric's experience covers the *entire field* of electric crane and hoist drives—from a 500-ton crane to 200-pound hoists.

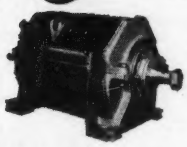
FACT #2—General Electric offers a *complete* line of electric equipment for cranes or hoists—to operate from a-c or d-c power systems.

For these reasons, General Electric is particularly well suited to work with you on electrification of any crane or hoist—or any piece of materials handling equipment. Find out for yourself now by calling in a representative from your nearest General Electric office. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

SEE this modern materials handling program

Ask your materials handling equipment supplier or G-E representative to show you "Materials Handling—In Receiving, Warehousing and Shipping"—General Electric's authoritative new movie covering in detail the latest techniques and equipment, without sales bias. When you see the movie, you will receive a copy of the 92-page technical manual which supplements the film. ***ASK TO SEE THIS PROGRAM NOW!***

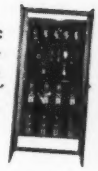
D-C CRANE & HOIST DRIVES



Type MD 600 Motors for trolley, travel and hoist drive, are sturdy, dependable units, built for long life under tough conditions. Other d-c motor types are available to completely cover all crane applications.

NEW **D-C Two-Magnet Brake** provides fast, sure action, yet occupies little space; is simple and easy to maintain.

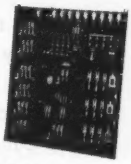
NEW **D-C Magnetic Control** with dynamic braking provides fast and accurate performance with maximum safety, for the toughest, most exacting duty. For every d-c crane, drum, master, and limit switches, protective panels and resistors are available as required.



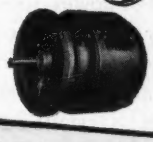
A-C CRANE & HOIST DRIVES

Tri-Clad Type MR slip-ring motors are widely used for driving cranes and hoists from a-c power supply. Types KR and KG high-torque squirrel-cage motors are available where constant speeds are satisfactory.

A-C Controls. General Electric offers both magnetic and manual control, Thrustor brakes, resistors, master, drum, and limit switches. Max-speed and other adjustable-voltage controls available for special jobs.



UNIT HOIST DRIVES

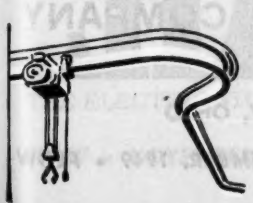


A complete line of a-c and d-c motors is available for mounting as an integral part of small industrial hoists.

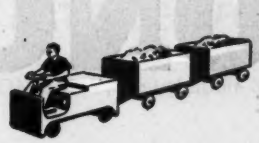
GENERAL ELECTRIC

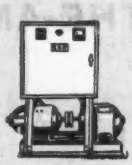
668-71

HOIST DRIVES

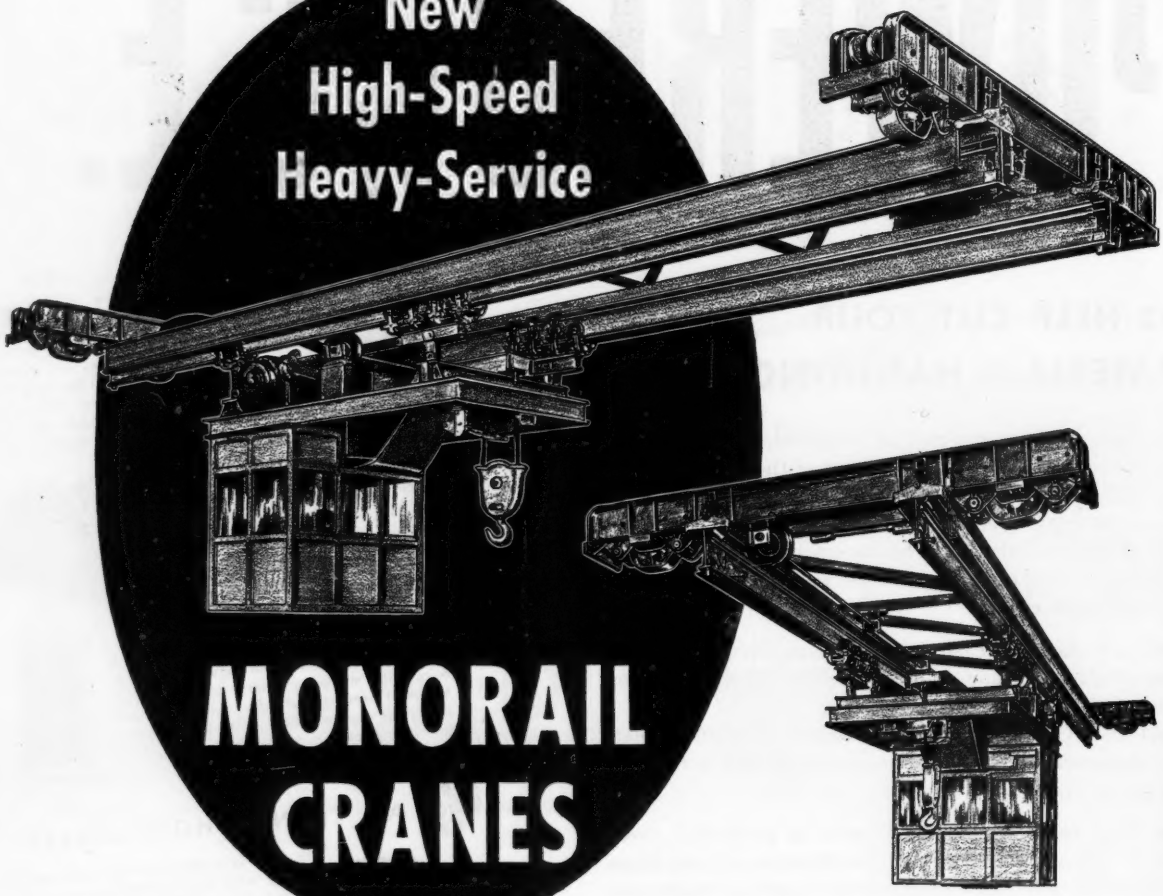


INDUSTRIAL TRUCK DRIVES & BATTERY CHARGERS





New High-Speed Heavy-Service MONORAIL CRANES



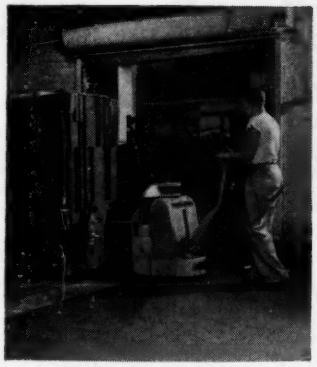
These new American MonoRail Cranes offer all the advantages of easy movement, rugged construction, low-cost operation and quick installation to handle load capacities up to 10 tons. American MonoRail Cranes operate by cab or floor by finger-tip control. Interlocking devices permit carrier to travel beyond craneways—either manual or power-operated. Loads are moved over maximum area, every square foot of operating and storage space is served. Twin-bridges with carrier mounted between bridges bring load clearance to uppermost limit for low head-room operation. Cranes can be installed under present operating conditions without excessive structural changes. American MonoRail Cranes are available for any type of job. An American MonoRail engineer will be glad to discuss the possibilities of crane operation, regardless of the type of handling.

Send for Bulletin MF-1 describing the development of American Mono-Rail Cranes.

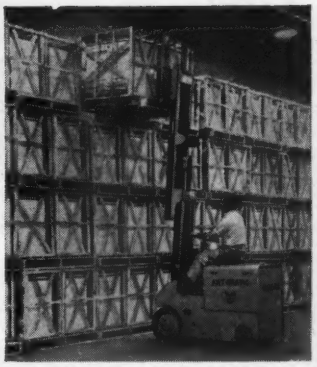
THE AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE CLEVELAND 7, OHIO

DEPENDABLE POWER



AUTOMATIC TRANSPORTER



AUTOMATIC FORK LIFT TRUCK

Battery Electric Trucks and EXIDE-IRONCLAD BATTERIES

CUT COSTS ALL ALONG THE LINE

With battery electric trucks in your plant, materials will move faster, smoother, safer, easier . . . and at a BIG saving—often as much as 50% or more. When powered by Exide-Ironclad Batteries, you can count on full shift availability with minimum power and replacement costs.

The EXCLUSIVE positive plate makes Exide-Ironclad Batteries DIFFERENT

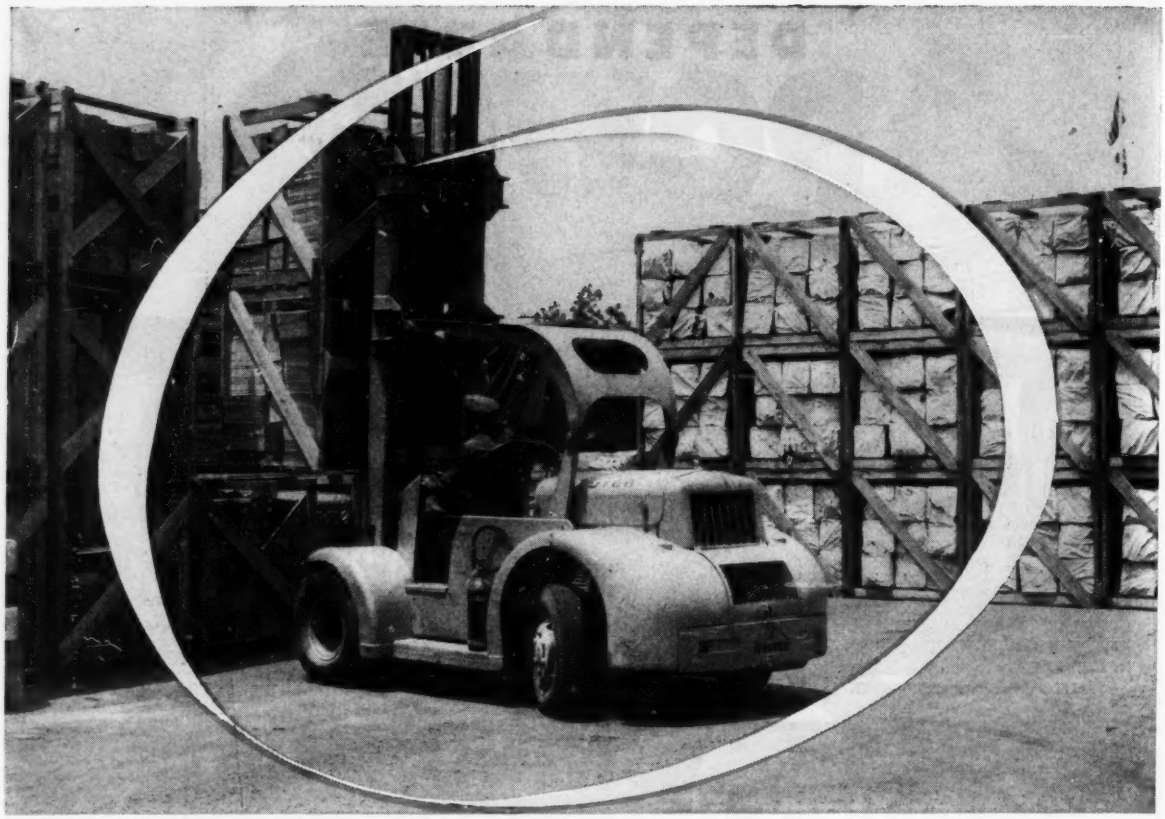
They differ not only in construction, but also in performance and length of service life. Exide-Ironclad Batteries have ALL FOUR of the essential characteristics that a storage battery must have to assure maximum performance from battery electric trucks—high power ability, high electrical efficiency, ruggedness and a long life with minimum maintenance. The combination of these four Exide-Ironclad characteristics assures years of day-in, day-out service with dependability and economy.

Write for further particulars and FREE copy of Exide-Ironclad Topics, which contains latest developments in materials handling and shows actual case histories.

1888...DEPENDABLE BATTERIES FOR 61 YEARS...1949

"Exide-Ironclad" *Reg. Trade-mark U. S. Pat. Off.*

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • *Exide Batteries of Canada, Limited, Toronto*



HYSTER 150...*King of Lift Trucks*

HERE'S THE HYSTER that has *worked* its way to the top by cutting costs in the MANUFACTURING INDUSTRIES. 15,000 lb. capacity. Handles anything. Pneumatic tires. Easy on the operator. Heavy duty gasoline engine. Full hydraulic braking system. 17½ ft. lift to underside of load on 42 in. load arms. Hoists, transports, tiers heavy or bulky loads—inside or outside. Want a demonstration? Or a list of users? See your Hyster distributor.

Hyster manufactures 7 lift truck models, which have capacity ranges from 2,000 lbs. to 30,000 lbs. All are equipped with pneumatic tires. Write for literature.

HYSTER® COMPANY

THREE FACTORIES

2931 N. E. CLACKAMAS, PORTLAND 8, OREGON
1831 NORTH ADAMS ST., PEORIA 1, ILLINOIS
1031 MEYERS STREET...DANVILLE, ILLINOIS

To FLOW:

Export Trade

One of our foreign jobbers has inquired for names of manufacturers of machinery that is used in the make-up of folding boxes and trays.

If you can give us this information we will relay it on to them.—F. Horwitz, Hayssen Manufacturing Co., Sheboygan, Wis.

This is typical of the inquiries which FLOW receives regularly from abroad. A fairly comprehensive list of manufacturers was sent to Reader Horwitz promptly.—Ed.

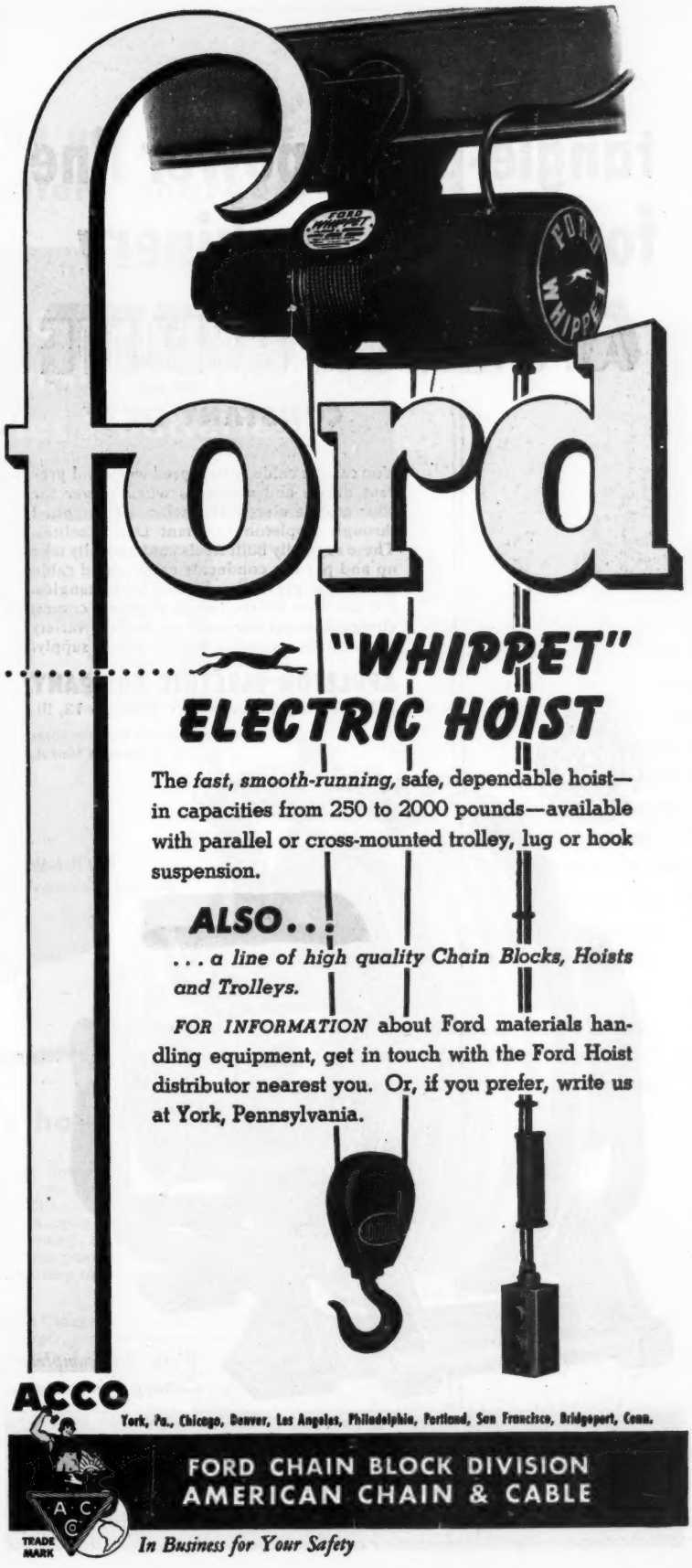
To FLOW:

Continuing Educational Effort

For several months the firm with which I am connected has been receiving FLOW Magazine through the courtesy of The Walter C. Stich Co. of Jacksonville. We want you to know that we, as users of lift trucks, strapping materials, and hydraulic dump delivery trucks, are interested in your publication, and we want at this time to express appreciation for your courtesy in sending it to us.

However, this letter is being written by me as Chairman of the Materials Handling Committee of the National Retail Lumber Dealers Association. In order that you may become familiar with the duties and purposes of this committee, I am enclosing a copy of a report made to the Board of Directors of the Association at a meeting held in Washington in early 1949. Another meeting of the full membership will be held in San Francisco the week of November 7th, at which time we expect to make a more complete report on the various types of materials handling equipment, and the manner in which it may be used to the best advantage in the yards of the various dealers.

Our committee believes there is


ford
"WHIPPET"
ELECTRIC HOIST
The *fast, smooth-running,* safe, dependable hoist—in capacities from 250 to 2000 pounds—available with parallel or cross-mounted trolley, lug or hook suspension.
ALSO...
... a line of high quality Chain Blocks, Hoists and Trolleys.
FOR INFORMATION about Ford materials handling equipment, get in touch with the Ford Hoist distributor nearest you. Or, if you prefer, write us at York, Pennsylvania.
ACCO
York, Pa., Chicago, Denver, Los Angeles, Philadelphia, Portland, San Francisco, Bridgeport, Conn.
FORD CHAIN BLOCK DIVISION
AMERICAN CHAIN & CABLE
TRADE MARK
In Business for Your Safety

tangle-proof power line for moving machinery

APPLETON REELITE

TRADE MARK

CONSTANT DUTY

You can cut cable costs, speed work and prevent delays and accidents when power for your mobile electrical machines is supplied through Appleton Constant Duty Reelites. These ruggedly built Reels automatically take up and pay out conductor cable—hold cable gently taut, preventing breaks, kinks, tangles. For use with hoists, lifting magnets, cranes, chargers, generator sets—an endless variety of machines requiring flexible power supply.

APPLETON ELECTRIC COMPANY
1728 Wellington Avenue • Chicago 13, Ill.
Branches and Resident Representatives in all Principal Markets

Sold Through Electrical Wholesalers

Write for complete Catalog information

APPLETON

CONDUIT FITTINGS • LIGHTING EQUIPMENT • OUTLET AND SWITCH BOXES
EXPLOSION-PROOF FITTINGS • REELITES

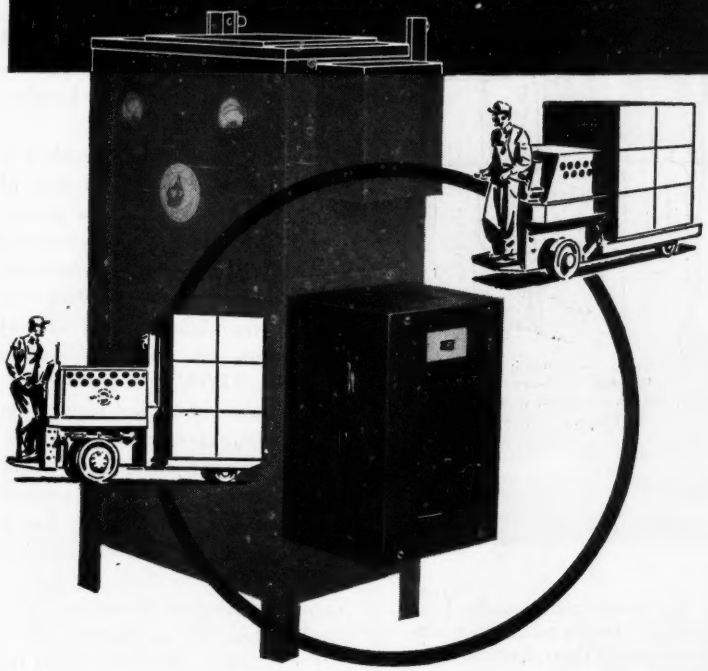
need for more educational material to be furnished to the dealers. This may be accomplished in part through distribution of literature, slides and films, for which we have already had calls from association secretaries, and by appearances of well-informed representatives with talks or exhibits before groups of organized dealers, such as conventions of state and regional associations. We should know also where to turn when called for recommending the services of a competent materials handling engineer, for converting an existing yard, or building a new one, for use of materials handling equipment.

From the report, you can understand that the committee desires to have all this information at hand. However, we, as a committee of busy dealers, have not the time to make a thorough study, and neither should we be the ones to have the information on hand when called upon for it. Rather, we feel that the manufacturers themselves should have this compiled in some kind of directory, with a copy furnished to each member of the committee for reference, and, if it is found to be useful, we in turn will recommend it to the secretaries of all the federated lumber associations comprising the National. At the time of our meeting in May we found that the supplement on Materials Handling and Equipment in the March 1949 issue of the Building Supply News had the most complete information at that time, so we suggested its use until something more complete were compiled. You will notice our references to your publication in our report, along with other trade journals that had given some study on the subject.

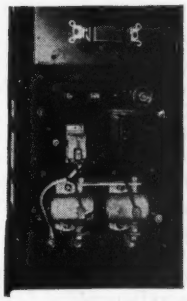
In your July issue we notice that you will soon have available your 1949-50 Flow Directory. Perhaps this is in line with the recommendation of the committee as one source of the information which we are seeking. We hope to obtain, and must have, the cooperation of trade journals, manufacturers, and dealers in order to do a good job.

Now
double the use of your copper-oxide battery charger.

With the new G-E Sequence Charge Control, a single-battery charger handles 2 batteries



Imagine two batteries on one rectifier charger! That's just what you get with the new G-E Sequence Charge Control. Hook up two batteries instead of one at closing time—and by morning you have two fully charged batteries. No experts needed. No supervision necessary. Simply clip on the batteries, set the time control to the proper charge and forget it. The Sequence Charge Control does the rest—even to automatically cutting out the charger when a full charge is reached.



Here's how it works

Both batteries are connected to the charger. The time control is set and the charging starts automatically—in sequence. First one battery receives a high-rate charge until it's about 85 per cent charged. Then automatically the other battery receives its high-rate charge. Here the charging rate changes—again automatically. Both batteries receive, simultaneously, a safe, finishing rate charge until they are up to full capacity. At this point, the charger automatically cuts out. (Should you have only one battery to charge, flip a switch and it operates as a single-battery charger.)

A MONEY-SAVER FOR YOU With a G-E Sequence Charge Control installed on your present—or new—copper-oxide battery charger, you can handle twice as many batteries. Yet the cost is much less than that of an additional charger. You still retain every single feature of G-E copper-oxide battery chargers that has made them industry's favorite—automatic operation, two-rate charging, practically no maintenance, complete flexibility and 100% dependability. You'll want more information! Send in this coupon today—for the latest short-cut in material-handling costs.

GENERAL ELECTRIC

Section H456-201
Apparatus Department
General Electric Company
Schenectady 5, N. Y.

I want more information on the G-E Sequence Charge Control:

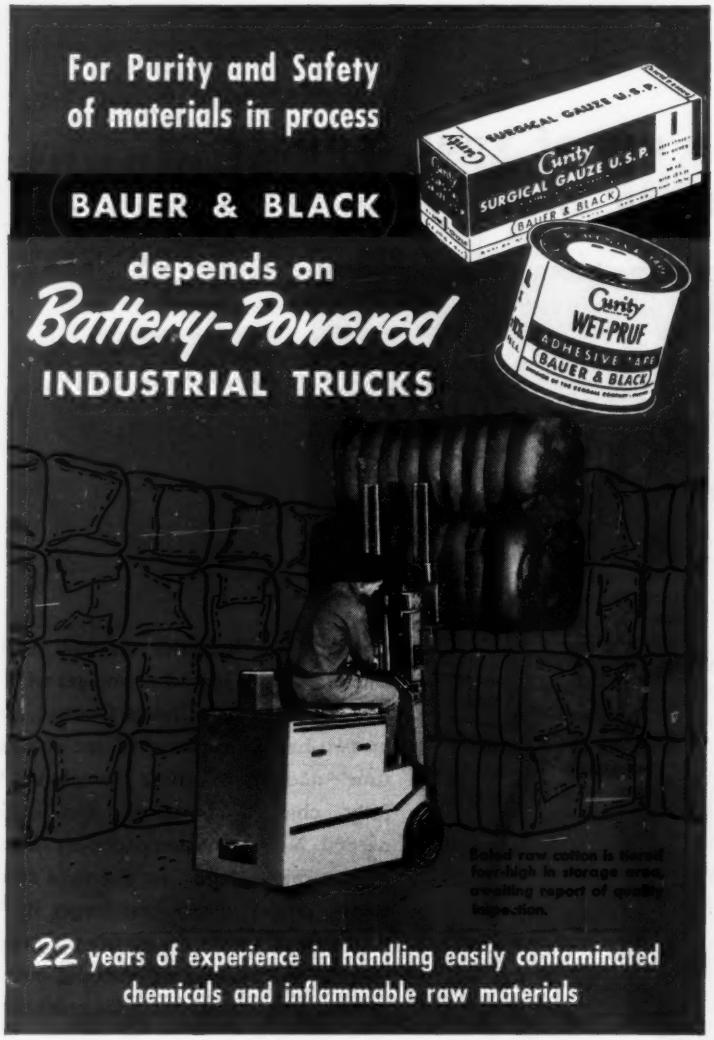
☐ Please have a G-E representative call.
☐ Please send me, free, Bulletin GEA-5272

Name ..... Title .....

Company .....

Address .....

City ..... Zone .... State .....



Cleanliness is a must at the Chicago plant of Bauer & Black —a Kendall Company division. Also protection of combustibles, since some of the products moved about and stored are highly inflammable; for instance, the thousands of pounds of raw cotton handled daily, or several of the chemicals used in treating finished products.

Twenty-two years ago Bauer & Black helped achieve both these objectives in material handling by purchasing their first battery-powered industrial truck. Additional battery-powered trucks followed. Now electric industrial trucks are an essential part of the production method at Bauer & Black's plant. A plant official says "their natural ruggedness of construction keeps the trucks in operation at all times and available when they are wanted. We have had very little maintenance, even with our oldest trucks."

Another example of electric truck cleanliness and safety helping industry—while providing material handling *at lowest cost per unit moved.* This criterion, rather than initial investment, explains why "America's Top Industries Prefer *Battery-Powered* Trucks!"

THE ELECTRIC INDUSTRIAL TRUCK ASSOCIATION
2701L North Broad Street, Philadelphia 40, Pa.

If we get such assistance, there is no doubt that it should return great benefits to all those who are willing to join in this program.

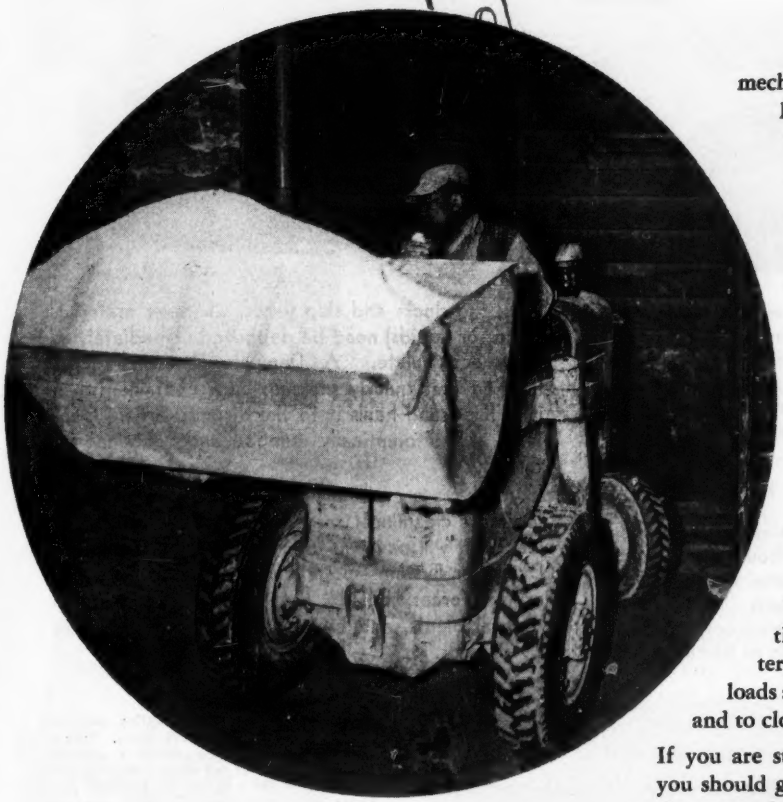
Certainly, a magazine devoted to materials handling primarily, should have some ideas that would be helpful to our committee. Any suggestions you care to contribute will be welcome to each member of the committee whose names and addresses are shown on the report, and I would appreciate your sending to each of them the same information given to me as chairman, so that we may all be equally informed prior to the meeting that will be held this coming November, at which time we shall be called upon to make another report.—James F. Mack, Mack Lumber Co., Hollywood, Fla.

Reader Mack was furnished a number of sources for the type of data he mentions, and has doubtless discovered in the meantime that manufacturers of material handling equipment (pertinent to his industry) have a good deal of information on lumber handling available. FLOW, too, has presented a number of varied reports on the subject, gathered by staff members in different parts of the country. Following is a list of articles from past issues. 1. Aiming For A Perfect Score (Brunswick-Balke-Colender), March 1946. 2. A New Note In Lumber Handling (Rudolph Wurlitzer Co.), October 1946. 3. Found—Two Acres (Forest City Material Co.), February 1947. 5. Unloading Time—362 bd. ft. Per Minute (EKCO Products Co.), January 1948. 6. 20% More Production, 35% Lower Cost (Nickey Brothers, Inc.), November 1948.

FLOW agrees with Reader Mack that modernization requires the kind of sustained educational effort evidenced in the above articles.

This inquiry is fairly typical of the thinking of Material Handling Committees for a number of national associations in various fields, with whom Flow has been asked to cooperate. We welcome the opportunity to serve.—Ed.

Take the Hand Out of Bulk Material Handling!



The Payloader way is the modern mechanical way to shovel, carry, unload, load, dump, windrow, pile and spread bulk materials. PAYLOADERS are designed to do these jobs and *are* doing them in scores of plants with great savings in time, labor and costs.

Payloaders work inside or outside, on hard floors or soft ground, in congested areas, through narrow doorways and aisles at speeds up to 16 miles per hour. They have ample power, traction and balance to dig full loads of tough materials, to carry them fast and lift, dump, load, spread or windrow them where desired.

The hydraulic bucket control gives the operator complete, precise mastery of the bucket motion—to dump loads slow or fast, partially or completely, and to close the bucket.

If you are still "manhandling" bulk materials, you should get the facts on PAYLOADERS—they pay, they're proven and they're sold and serviced by a Hough Distributor near you. The Frank G. Hough Co., 731 Sunnyside Avenue, Libertyville, Illinois.

SEND FOR CATALOGS
on any of the four sizes of Payloaders: the 10½ cu. ft. Model HA; the ¾ yd. Model HF; the 1¼ yd. Model HL; the 1½ yd. Model HM, also the 2 yd. Payloader Buggy.

SAY HUFF

HOUGH PAYLOADER

Manufactured by THE FRANK G. HOUGH CO.

Keeping the Navy "*Ship Shape*" with the Dempster-Dumpster . .

Shipyards, stations, and the men in Uncle Sam's Navy set a standard of cleanliness that is unsurpassed. Helping to maintain this high standard of Navy cleanliness is the Dempster-Dumpster System of materials handling . . . a system of quick pick-up of preloaded containers for hauling, dumping or moving materials.

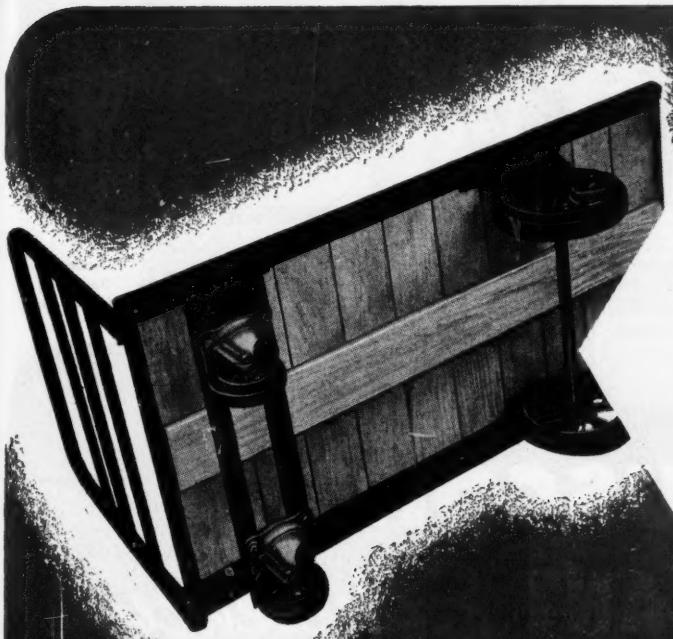
Exactly 10 years ago the Navy purchased its first Dempster-Dumpster equipment . . . one truck hoisting unit with several containers. Now there are dozens of hoisting units and thousands of Dempster-Dumpster containers of many types at work keeping Navy yards and stations "ship shape." The sturdy steel foolproof and fireproof containers are placed at various places, such as barracks, mess halls, the docks and ship yards, wherever materials (solids or liquids) need be deposited immediately as they accumulate. A Dempster-Dumpster truck hoisting unit quickly picks-up each container when it is filled and hauls it to the disposal area. Contents are automatically dumped and container returned.

If you have a materials handling problem demanding more cleanliness, more economy, and more efficiency, it will pay you to investigate the Dempster-Dumpster System—popularly used, not only by the armed forces, but by municipalities, leading industrial plants, and by large and small institutions of all kinds.

Photo above shows eleven hoisting units recently delivered to the U. S. Navy. Various types of containers are shown in carrying positions. Photo at left shows a hoisting unit preparing to lift a 10 cu. yd. Flat Top container, while another hoisting unit is dumping a 9 cu. yd. Trash and Rubbish Kolector type container. All controls of unit are conveniently located at the driver's seat. One driver and one truck handles any number of containers regardless of types.

DEMPSTER BROTHERS INC.

8119 N. Knox
Knoxville 17, Tennessee



STEEL
WHERE IT'S NEEDED

WOOD
WHERE IT'S NEEDED

FAIRBANKS STEEL-FRAMED TWO-WHEEL TRUCK is available in 20 sizes and types to meet specific job requirements

FAIRBANKS®...
Steel-Framed Trucks

● Your truck costs go down and your men get more done in less time with Fairbanks Steel-Framed Hand and Platform Trucks.

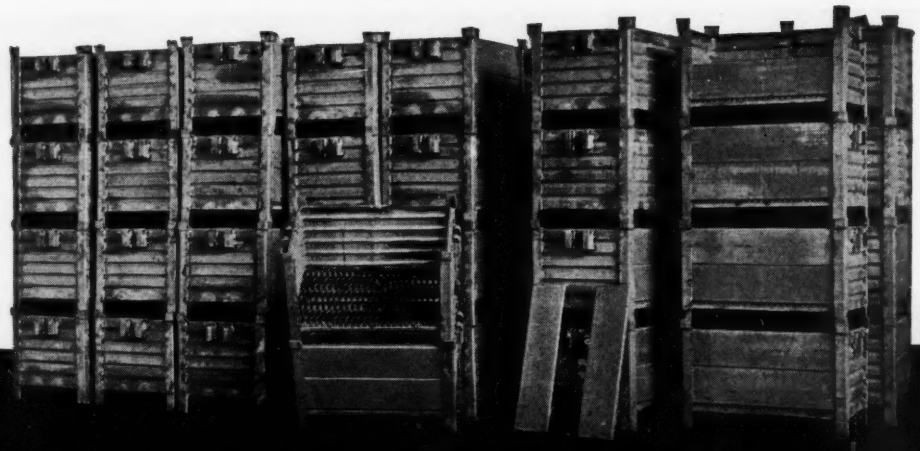
The reason is simple. Fairbanks has effectively combined the structural advantages of steel and wood to provide hand and platform trucks that stand up under all kinds of punishment in service . . . that have shock-absorbing qualities which cushion heavy loads, dampen vibration, reduce operator fatigue.

Like all Fairbanks Trucks (over 90 basic designs with hundreds of variations) each of these Steel-Framed trucks is developed from on the job experience to put the maximum speed and ease into specific types of load-handling. For example, the "Commander" Steel-Framed Platform Truck shown above comes in 20 sizes from 24" x 42" to 36" x 72", with 3 platform heights (18", 14", 9½") and Tilt or Non-Tilt running gear.

Full information on any one or the complete line of Fairbanks Trucks may be had from any of the offices listed below.

American Industry Rolls on Fairbanks Trucks

THE fairbanks COMPANY

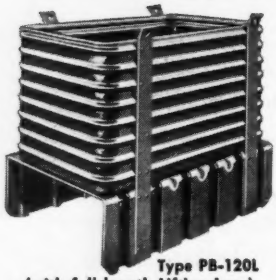


Truscon Open-Side Steel Boxes

TRUSCON

Speeds PLANT *Efficiency*

WITH STEEL BOXES AND SKIDS FOR MOVING & STORING MATERIALS

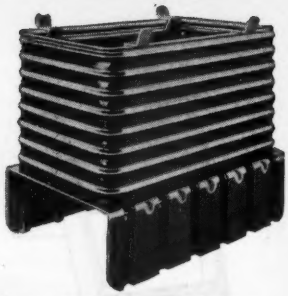


Type PB-120L (with full length Lifting Lugs)

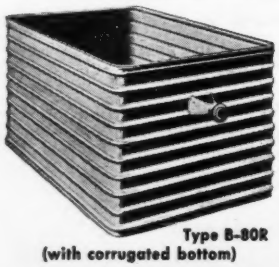
TRUSCON OPEN-SIDE BOXES *(shown above)* . . . speed efficiency through side-loading and tiering. Materials are easy to store, easy to get at, easy to inventory!

TRUSCON MATERIALS HANDLING EQUIPMENT . . . speeds efficiency because boxes, pallets and platforms are designed to properly fit modern lifts, and are ruggedly built to stand the gaff of factory use.

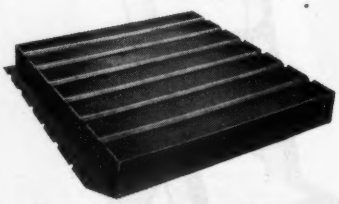
Send for catalog, complete with specifications and details, on Truscon Materials Handling Equipment.



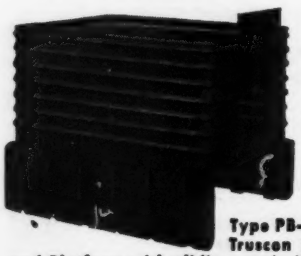
Type PB-120T Truscon Steel Box and Platform with Tiering Lugs



Type B-80R (with corrugated bottom)



Truscon Double Face Steel Pallet



Type PB-650 Truscon Box and Platform with sliding end door

TRUSCON STEEL COMPANY

PRESSED STEEL DIVISION

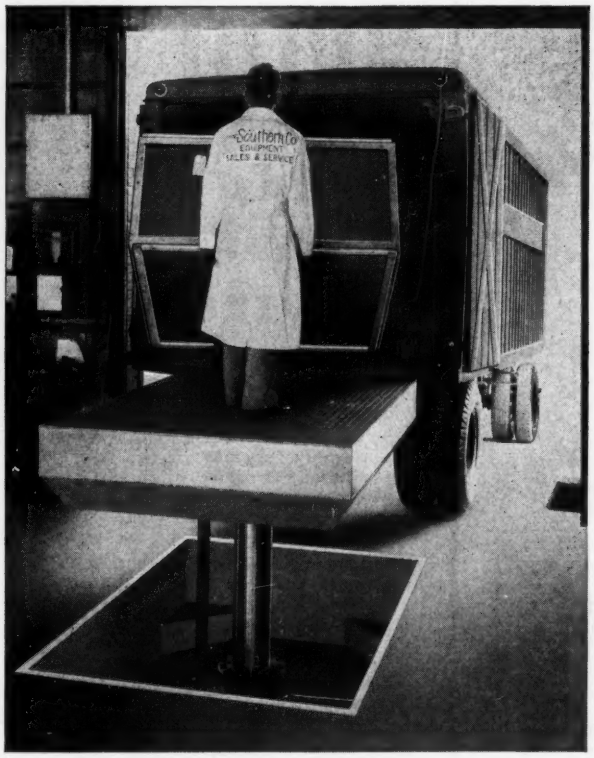
6100 Truscon Avenue • Cleveland 4, Ohio

Subsidiary of Republic Steel Corporation

Type PB-120 Truscon Steel Box and Platform

LABOR·SAVER

Levelator pays for itself in a few months



Your file on materials handling equipment is incomplete without a Levelator catalog. Contains detailed description and illustrates wide range of Levelator applications. Mail coupon below.

Levelator Oildraulic Lifts handle heavy materials directly from plant floor to trucks, freight cars or different building levels. Labor costs drop, plant traffic speeds up, efficiency increases. Oil hydraulic operation (compressed air or electric) is powerful, dependable, economical.

Levelator recesses into floor and can be trucked over . . . eliminating need for loading dock and ramps. Metal skirt guards furnished when required.

Quantity-production price on Standard Levelators

90% of all short-haul lifting problems can be solved most economically with the Standard Levelator. Load deck is 6′x8′, capacity 6,000 pounds, maximum rise 5 feet. Through quantity manufacture in this size, Rotary offers Levelator efficiency at minimum cost. For machine feeding, transfer bridges and other special uses, Levelators are built in larger sizes, with capacities up to 80,000 pounds.

Rotary Lift Co., 1011 Kansas, Memphis 1, Tenn.

Rotary®

LEVELATOR

OILDRAULIC LIFT

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ROTARY LIFT CO.
1005 Kansas, Memphis 1, Tenn.

Send me complete information on Levelators.

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*Attention*_____

*Address*_____

*City*_____ *State*_____

20% greater rollability...

Aerol-Seal Wheels

Aerol General Purpose Wheels

Aerol Resilient Vulcan Wheels

Aerol Pneumatic Wheels

Aerol-Seal Heavy Duty Wheels

Aerol Xtra Heavy Duty Wheels

Aerol Standard Caster Rigs

Aerol Heavy Duty Caster Rigs

Aerol Aerotucker Hand trucks

Aerol Universal Hand trucks

Differential-Action Rubber Tired Powered Pallet Loader Wheels

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aerol

WHEELS
CASTERS
HANDTRUCKS

Aerol Co., Inc. has attained its position in the "Materials Handling" field not merely due to an awareness of problems which have plagued industry for many years, but rather in assuming the challenge to solve them and in possessing the courage to fabricate and market the resulting developments.

Industry today, recognizing the need for replacement of inferior and frequently non-standard purchases, is in a "mood" for change-over to equipment at a price commensurate with the highest standards of workmanship providing that as a result, maintenance, replacement inventories, and non-productive labor costs would be reduced materially—and—the ever increasing sales of AEROL Products is convincing evidence not only of their acceptance, but also of their ability to completely satisfy the requirement.

Contact the nearest Factory Branch for the name of the Aerol distributor in your area.

- 2820 ONTARIO STREET
  Burbank, California
- 884 N. HALSTED
  Chicago 22, Illinois
- 1241 E. 26th STREET
  Cleveland 14, Ohio
- 40-60 LAWRENCE STREET
  Flushing, Long Island, New York

AEROL CO. INC.

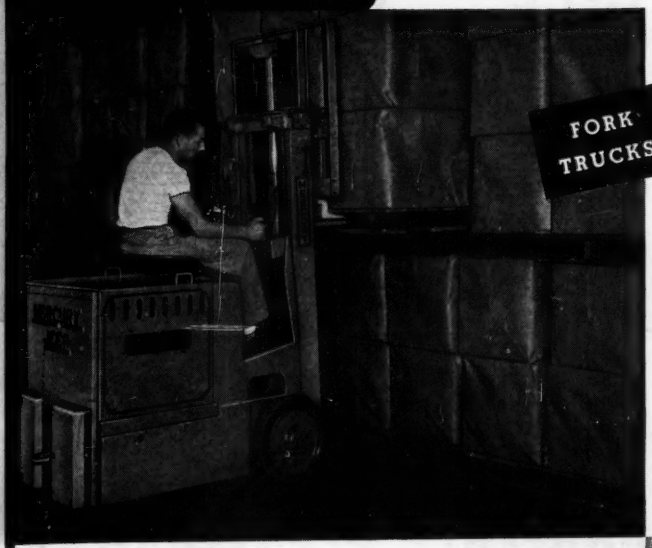
NO WHEEL ROLLS LIKE AN AEROL

GUARANTEED 20% EASIER ROLLABILITY

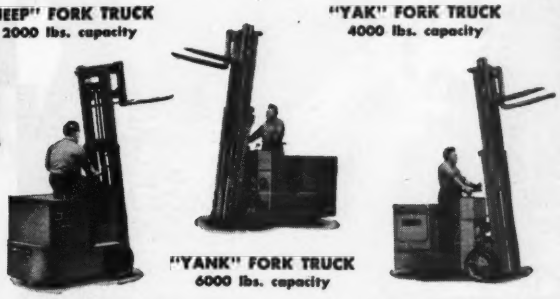
2820 ONTARIO STREET - BURBANK, CALIFORNIA

Mercury brings you 38 years material handling experience!

ORIGINATORS OF THE MERCURY "TRACKLESS TRAIN" SYSTEM OF MATERIALS HANDLING



FORK TRUCKS



"Jeep" Sit Down, Center Control Fork Truck, 2000 lbs. capacity. Compact design affords easy manipulation in confined areas.

"Yak" Center Control Fork Truck, 4000 lbs. capacity. Rugged design.

"Yank" Center Control Fork Truck, 6000 lbs. capacity. Designed for tough continuous service.

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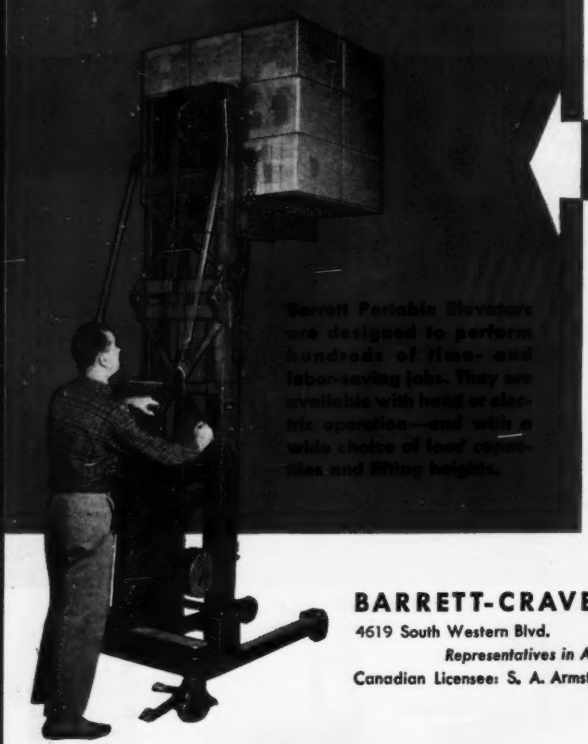

Barrett Portable Elevators are designed to perform hundreds of time- and labor-saving jobs. They are available with hand or electric operation—and with a wide choice of load capacities and lifting heights.

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And you save plenty of it with Barrett Portable Elevators. Take these materials . . . often requiring floor level storage because they're too heavy for hand stacking . . . and pile them ceiling high. All that wasted air space is put to work . . . and floor space is cleared for extra production. And Barretts save, too, on heat, light and maintenance . . . perhaps even the cost of a new building.

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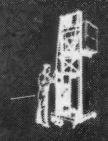
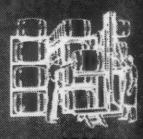
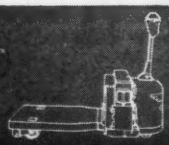


PORTABLE ELEVATORS

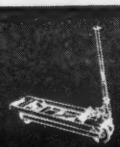


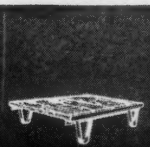
STEEL STORAGE RACKS



ELECTRIC

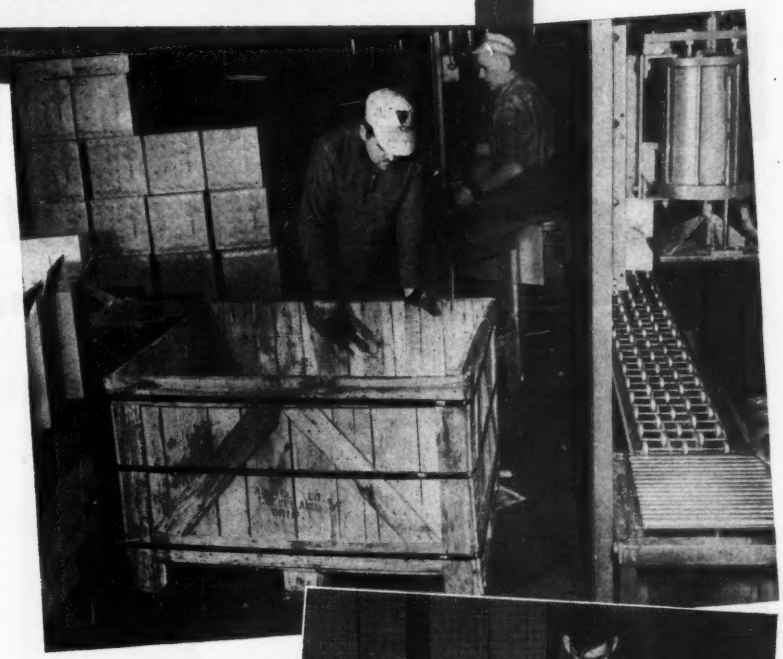
Barrett Handling Equipment





GABRIEL RELIES ON BRAINARD STRAPPING FOR SAFE, INEXPENSIVE SHIPMENTS OF FAMOUS SHOCK ABSORBERS

Pallet crating shock absorbers for shipment to automobile manufacturers. Note the crate is partially banded. When full, shipping department covers, straps and runs crate into waiting railroad car in a matter of seconds.



The Gabriel Company, world famous manufacturers of automotive shock absorbers, relies 100 percent on Brainard Strapping in shipments of their products to all corners of the earth.

Using pallet crates at the end of their production lines, Gabriel's shipping engineers find they can cut handling costs and shipping losses to a minimum. Prior to filling, the pallet crate is reinforced with Brainard Strapping. And Gabriel's customers have only to lift the crate onto their production lines and cut the strapping to have a workable parts bin that speeds their operations.

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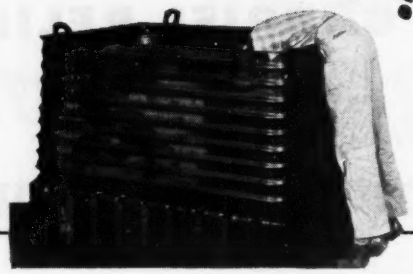
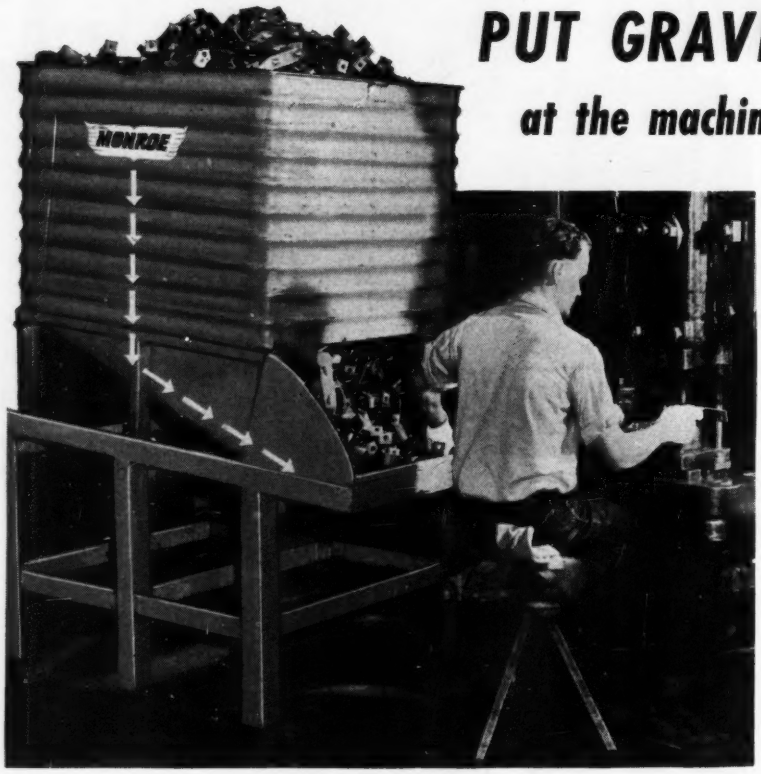
You can eliminate this waste motion, cutting labor and handling costs as much as 20%, with Monroe Drop-Bottom Skid Boxes.



MONROE DROP-BOTTOM SKID BOXES

PUT GRAVITY TO WORK

at the machine—on assembly lines



Gravity-flow from slanting floor of the Monroe Drop-Bottom Skid Box keeps stampings, castings and other small parts always accessible in waist-high tray of matching work stand.

●

Monroe Drop-Bottom Boxes can be used as conventional skid boxes or easily moved on or off separate work stand by ordinary high lift trucks.

●

Monroe Drop-Bottom Skid Boxes and separate work stands available in 6 different sizes and weights. Work stands come with choice of trays for delivery of parts to the front, or to the right or left side.

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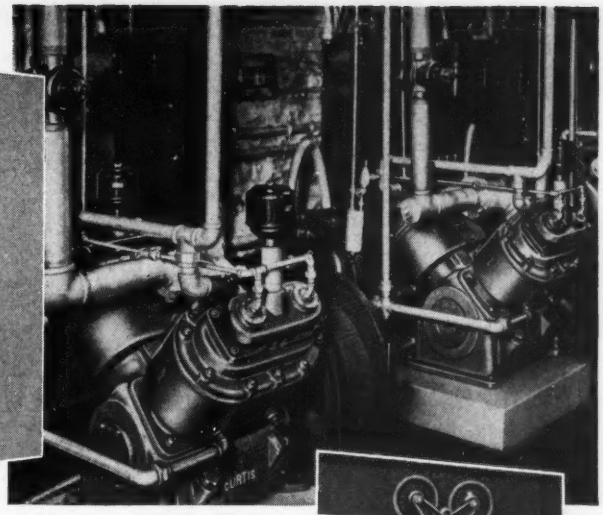
Monroe, Mich. — World's Largest Maker Of Ride Control Products

Reduce Production Costs with CURTIS AIR COMPRESSORS, AIR HOISTS AND AIR CYLINDERS



Plant after plant is turning to Curtis Air Hoists and Cylinders for pushing, pulling, lowering or lifting operations... and to multiple installations of Curtis Air Compressors, which eliminate long air lines, the possibility of air leaks, and losses resulting from breakdowns of central air compressor installations.

Here's why it will pay you to consider CURTIS *equipment*

AIR HOISTS AND AIR CYLINDERS

- Cannot be overloaded.
- Hoisting or lowering speed is controlled by operator.
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- Valve automatically returns to vertical position when released.
- Can be operated by unskilled labor.

AIR COMPRESSORS

- Timken-Bearing equipped—permits external adjustment.
- Self oiling—positive lubrication.
- Precision construction throughout.
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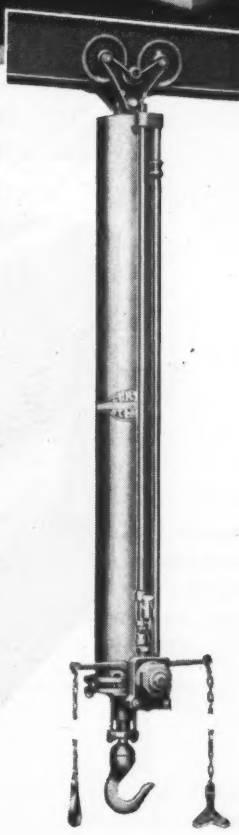
- Cylinder, crankcase, also heads made from gas-tight iron.
- Fully enclosed.

Curtis bracketed-type Air-Hoist Cylinder can be placed in any position from horizontal to vertical.



Curtis Pendant Air Hoist can be used for practically any lifting problem where the head room is not limited.

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INSET VIEW shows the end product a 5-room home, made from raw material pictured in large view. MONORAIL CRANE unloads raw material, strip and sheet stock.

5-Room Homes by Conveyor Flow

More than eight miles of conveyors carry component parts for the Lustron porcelain enamel home from the press department through the enameling plant and subassembly direct to shipping. The schedule is set up for 100 5-room homes per 24-hour day.

MONORAIL CRANES, CHAIN CONVEYORS, GRAVITY ROLLER AND WHEEL CONVEYORS.

MUCH has been said about means of mass-producing homes by factory methods—something that has been done by the Lustron Corporation since January of 1948 in its 1,100,000 sq. ft. plant at Columbus. The raw steel (in sheet and coil form) comes in at one end and leaves the plant at the other as finished components, ready to be assembled into a 5-room porcelain enamel home. The packing of these parts by the assembly line method, on the basis of one completed home per trailer, is described in the Packaging Mechanics section of this issue.

Complex Parts Movement Reduced to Simple Flow

While the flow of parts through the vitreous enamel plant is not without some complexity, the main flow lines are basically simple. The enameling plant with its 11 furnaces is one of the largest job shops of its kind; each unit with its spray booths and driers is conveyorized to the fullest extent possible. Complications are introduced by the use of several different colors for exterior parts, with about 215 different types of enameled components per house which break down into three separate classifications, as follows: exterior architectural panels, interior architectural panels, and sanitary ware items. (Structural members and components for cabinets are processed elsewhere in the plant, and will be indicated in their proper places in the flow pattern).

Since this article considers the broader aspects of the plant-wide flow, it need only be said here that the individual conveyor lines serving each furnace with its auxiliary equipment are synchronized to pro-

By THOMAS KIRCHNER
Plant Layout Engineer
The Lustron Corporation, Columbus, Ohio

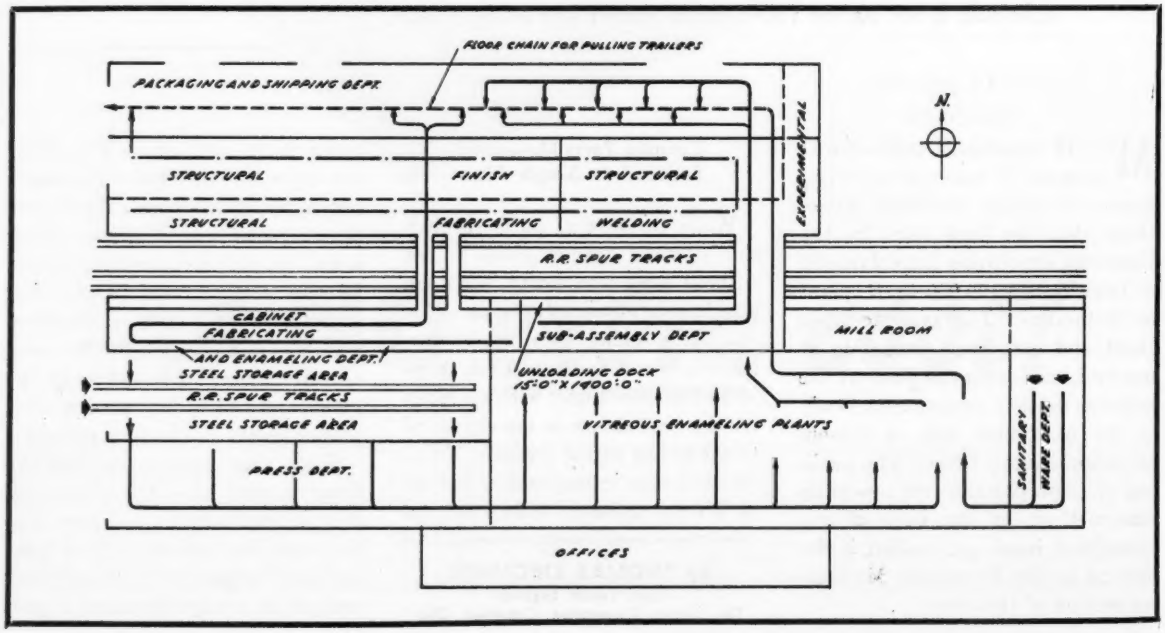
GRAVITY CONVEYORS serving press department. For processing, parts are loaded on chain conveyor, shown in background.

CHAIN CONVEYOR carries panels from pickling to enameling. Note typical parts baskets used. See drawing, facing page.

duce the required number of components of each color in accordance with the production schedule. The transport conveyors carry the parts to their ultimate destination on the load line in another building.

The schematic flow diagram on these pages illustrates the over-all flow pattern, which involves more than eight miles of overhead chain and a variety of floor-mounted conveyors. The latter include both powered belt and gravity lines. The material flow is designed to transport the metal piece parts west to

SCHEMATIC DRAWING shows work areas and flow of material in both plants, also load line.



east from the press department through the enameling plant, and then south to north through subassembly to the packing or load line. A smaller part of the conveyor installation originates in the sanitary ware department, located in the far east end of the plant, where bath tubs and kitchen sink components are fabricated. These items are likewise conveyed through the centrally located enameling plant, whereupon they follow the south-to-north flow to the packing-shipping dock.

The various operating areas are shown in the flow diagram. The plant facilities consist of two buildings (A and B), which are separated by a yard with railroad spur tracks. The yard area is spanned by two 105 ft. bridges, through which the conveyors travel to deliver the parts to destination. Building A is 340′ x 1400′ and Building B, 200′ x 1000′. The overhead chain conveyor system transporting the ware through the bridges ties the two buildings into a single operating unit.

Methods for Flow Procedures

Raw steel arrives in the center of the extensive press department at the west end of the plant, usually by highway trailer, where rail facilities are likewise provided. The entire high bay area is covered by a system of eight monorail cranes of 5-ton capacity. These cranes are of the interlocking type and can therefore transport the lifts in a longitudinal and lateral direction. While these cranes were originally used for airplane production, they are equally adaptable to the handling of coil stock (with hairpin hooks), sheet stock (with sheet grabs), and miscellaneous handling for which wire rope slings are employed. The crane elevation is 35′ 0″.

Most of the high production presses are in the south part of the room. When necessary, coil stock from the incoming trailers can be transported directly to these presses, which shape various types of architectural panels. The north side of the department is devoted to miscellaneous press work (brackets, clips, welded assemblies, and certain low-volume items).

In multi-press operations, the parts are transferred between machines on gravity conveyors, which also deliver the material to the stations at which the overhead transport conveyors are loaded. These stations, incidentally, are so arranged that operators at each one load relatively few types of parts. This avoids confusion on the part of the men.

Two chain conveyors circle the entire department. Traveling at 20 FPM, they serve the automatic pickling machines, which are located in the enameling plant. The first pickling machine takes the bulk of the exterior panels, the second one the bulk of the interior panels. As was mentioned in the introductory paragraphs, the enameling operations are conveyorized in so far as is practicable, with transfer stations between lines laid out for minimum walking and carrying. As can be seen from the flow diagram, the transport conveyors are unloaded at the south end, and reloaded with enameled parts at the north end of the enameling plant.

Conveyors Tie in Two Floor Levels

Five conveyors transport the ware after completion of the enameling process. These lines, which also travel at 20 FPM, cross the balcony area directly to the north of the enameling plant. (This higher level is indicated by "Sub-Assembly Dept." on the flow sheet.) Two of these conveyors cross the mezzanine at the far ends, the reason being that the parts conveyed on these lines do not have to be unloaded for assembly purposes; they continue through the previously mentioned bridges to the load line in Building B.

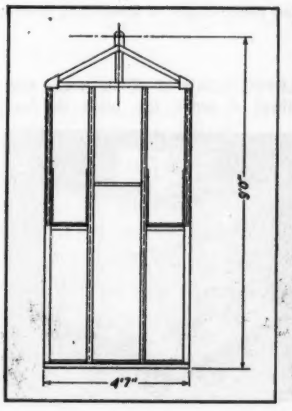
Parts to be unloaded for assembly are taken off the carriers on the north side of the mezzanine. Usually banks of the individual items are built on platform trucks. Subassembly consists of the attachment of blocks of fiber glass insulation and plastic weather sealing strips, which make these architectural components ready for installation to the Lustron home.

The assembly department is a rectangular area 100′ x 450′, and is strategically located in relation to fabrication, processing and packing.

(Turn to page 48)

ASSEMBLY CONVEYOR wheels are rubber covered. Baskets, rear, carry parts to the load line.

DIMENSIONAL SKETCH of universal basket which carries bulk of products.



How to Unitize Paper Bags for Shipment

Shown on these pages are two methods of unitizing empty bags, multiwalls and consumer type containers. The techniques illustrated were developed by two leading bag manufacturers and offer a number of worth-while ideas to bag users.

CONSIDERABLE progress has been achieved in making fully palletized shipments of multiwall and small paper bags. The results are so satisfactory that such shipments are made regularly on a routine production basis from a number of plants. This information is furnished by a major manufacturer of bags, who has conducted extensive research on this problem.

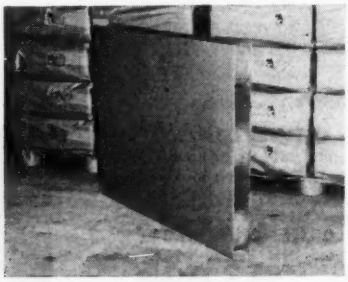
There remains room for improvement, the research men report. While there are probably adaptations of this method not as yet thought of, the work that has been done already is resulting in large savings on handling and storage costs.

Problem Has Four Phases

Wartime advances in palletizing did not immediately offer ready solutions to peacetime industrial palletizing problems. Not cost, but victory was the primary consideration of the armed forces, whereas current economic readjustments have placed added emphasis on cost reduction and increased efficiency.

Several important factors had to be considered in evolving a practical, economical palletizing opera-

1—STANDARD HARDWOOD pallet is used for paper bags because of its long service life.



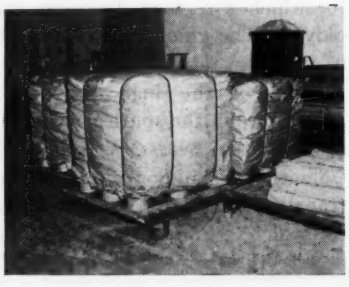
2—TYPICAL EXPENDABLE pallet made of corrugated paper board, is sometimes reused.

3—WOODEN BATTEN and kraft paper type pallet. Paper base is glued to wooden battens.

4—GLUE ROLLERS in conveyor section apply two strips to bale bottoms for glued load.

5—BUILDING LOAD of 10 lb. sugar bags. Tie in sheet of paper, top, binds the load.

6—Two STEEL STRAPS in each direction secure finished load of multiwall sacks.



tion. These break down into four general classifications, as follows: 1. Choice of the type of pallet. 2. Method of building the load and securing it to the pallet. 3. Method of handling loaded pallets. 4. Method of securing the load to withstand transit shocks and shifting.

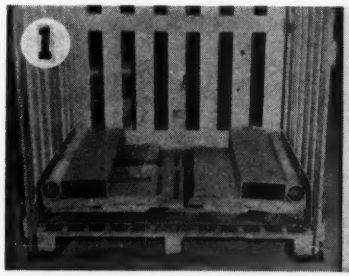
These problems will be considered in order. One of the easiest pallets to select was the well-built, permanent wooden pallet. This is capable of supporting and transporting almost any load and is readily handled by standard fork lift equipment. The "return" problem proved a difficult one.

Disposable pallets, light in weight and less expensive, can be obtained in both single and double deck types—that is, with a cardboard sheet either above or both above and below the legs. The latter are made from coils or rolls of glued corrugated board. Experience indicates that the double deck type is highly desirable. Loads on these pallets may be either glued or strapped.

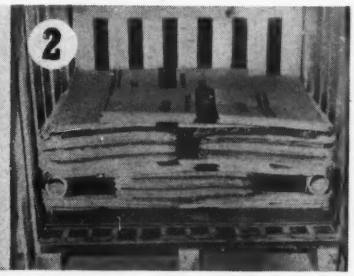
The wooden batten type pallet may be used in cases where small bags are pre-baled and where the bales are compact and capable of supporting considerable weight without collapsing. This pallet is composed of a fibre board tray supported by 2" x 4" wooden cross pieces. Bales on such pallets are adhered to each other.

ANOTHER LOAD UNIT METHOD FOR EMPTY PAPER BAGS

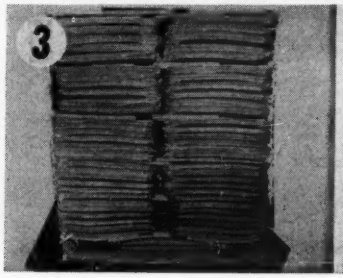
THE technique described here was developed by a leading bag manufacturer for unitizing large multiwall paper bags, sugar pockets, and similar consumer type containers. Built into the base of the unit are two paperboard slots, which accommodate the forks of any standard lift truck. See photos showing steps of building the load.—**Data and exhibits, courtesy Multiwall Bag Division, St. Regis Paper Co., New York City.**



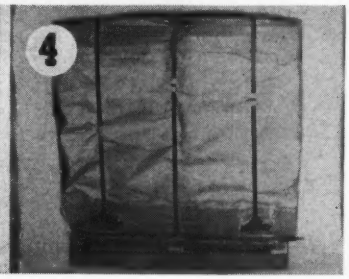
1—Layer of 10 multiwall bags is first placed on form, paperboard slots on top.



2—Multiwalls (1200 of these) are placed in interlocking pattern (3-4-5) for unit.



3—Complete load is subjected to 14,000 lb. pressure in order to make compact unit.



4—Unit is wrapped, then banded, ready for power handling. Load weighs 1160 lb.

Building Pallet Loads

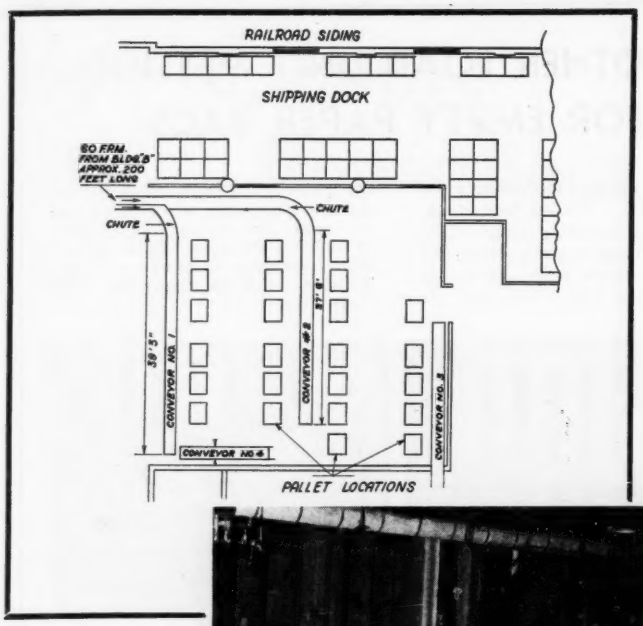
With a suitable pallet selected for the job, the next step is to determine methods for building pallet loads. These involve the size and shape of the units to be loaded, size of the pallet, the amount of compression, if any, which can be applied, and the question of whether the load can withstand strapping without damage. The amount of weight the units can support is also important, for the weight of other pallets superimposed (perhaps three or four high) must be taken into account.

It is almost a necessity that the arrangement of the units on the pallet be such as to provide interlocking of the "brick wall" type, with no vertical planes of cleavage. No set pattern can be laid out for such an arrangement because of the variation in the size and shape of the various units to be palletized. These run all the way from large multiwall bags down to bales of small paper bags.

One of the secrets of satisfactory palletization—where the nature of the product permits it—is adequate compression of the load before it is strapped and secured for shipment. This involves the construction of a load which will give a solid and flat top surface through the application of a heavy compressive force. The flat top surface is essential to permit the stacking of pallet upon pallet after delivery to the customer's warehouse. After compression, the load is wrapped, whereupon steel strapping (two strips in each direction) is applied around the load and through or under the pallet.

Small paper bags, which are prebaled and which cannot be subjected to strapping because the resulting distortion will interfere with subsequent use of the bags, must be cemented into a compact and interlocked load by means of adhesive between each of the prebaled units. The adhesive used for this purpose has very low tensile strength but high shear strength. Bundles adhered with this material

(Turn to page 54)



BELT CONVEYORS, CHUTES, PALLET-FORK-TRUCK METHOD

◀ **LAYOUT** of centralized sorting-palletizing room which brought about important operating economies.

GUIDES SPLIT main conveyor belt into dual lines for delivery of two different finished products. ▼

A $2.12 Per Ton Handling Cost Is Cut to $1.26

This modernization project—which reflects problems common to many plants—paid for itself in less than a year. A well planned belt conveyor system feeds this palletizing and sorting operation. A fork truck with side shifter and pusher attachment is used for car loading.

THE adoption of every fork-truck-pallet program has its own interesting ramifications, from plant to plant. Differences result from differences in plant structures, departmental layouts, the nature and the volume of the product and, among other factors, the immediate objective of the new program in relation to a particular production, layout or cost situation. Thus, the solution devised in every case taps new sources of engineering ingenuity, reveals new ideas for an approach to a problem

By ROBT. W. HYDE
Chief Engineer,
Clopay Corporation, Cincinnati

TOWMOTOR Electric Pallet Truck

selected by WRIGLEY

for speed . . . maneuverability . . . ruggedness

When you're producing millions of sticks of chewing gum *every day*—billions every year—you are faced with the gigantic task of unloading, storing and transporting a staggering amount of materials. This is the problem at the Wm. Wrigley Jr. Company's giant Chicago plant—the world's largest chewing gum factory.

To help maintain top efficiency in a competitive industry, Wrigley must be constantly alert to new developments in the materials handling field. That's why this leading manufacturer selected Towmotor Electric Pallet Trucks to augment its handling equipment.

One of the gruelling tasks is to transport and store 2400-lb. pallet loads on an inclined floor at the top of a warehouse building. The floor is rough board surface at an 8° angle. Towmotor is the only truck with enough power to handle full loads rapidly over this area!

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- **Rapid lifting of loads up to 4000 lbs.**
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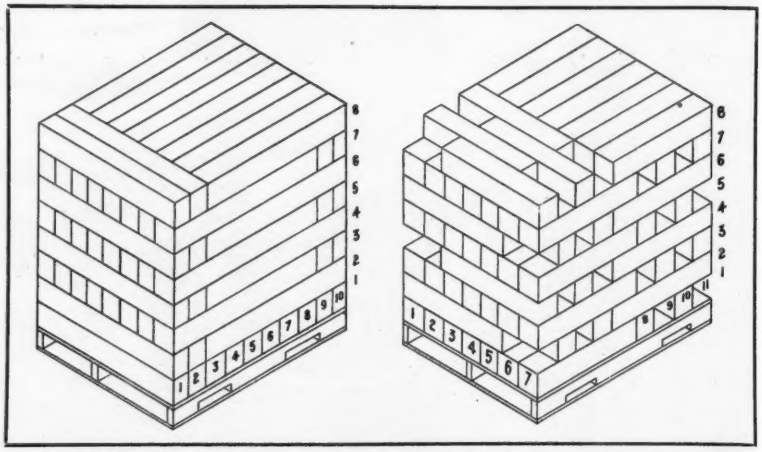
that many plants have in common.

Analyzing the Situation

The Clopay Corporation, Cincinnati, had to consider several problems when it surveyed its facilities in July of 1948 for the purpose of streamlining its finished goods handling procedures. Congestion in the shipping area and the number of manhours consumed in rail car loading and unloading were the two phases of a situation which the management ordered to be remedied.

Following are background details relating to general plant layout and operational procedures. Clopay's finished goods manufacturing takes place in Cincinnati, on three production floors in two buildings. The buildings are separated by a street. Both produce window shades, accessories and garment bags, all of which come in several dozen different sizes, types and colors. All this production is shipped by rail car to a central warehouse. The latter is the company's Norwood Plant, five miles distant, which also serves as the distribution point. (A self-contained operation devoted to another product, located elsewhere, is not involved in this description.)

Before palletization, two of the three production departments delivered the finished goods to the shipping floor on an intermittent basis; the third department sent the cartoned material to the common loading point by conveyor. The finished goods, not sorted, were wheeled into the cars and the individual cartons were hand-loaded to maximum visible capacity (totaling to an average of 50,000 lb. per freight car).



DRAWINGS OF two pallet patterns. Note interlocking feature of shorter type of cartons in drawing in right-hand column.

Study for Simplified Procedures

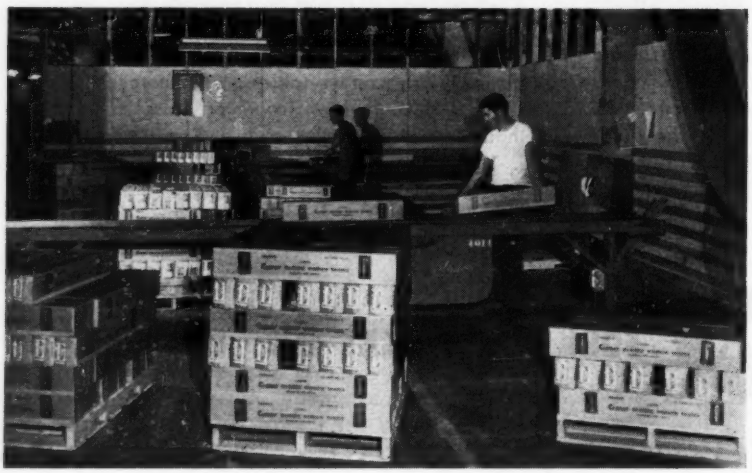
The manual operation added up to the following: Aside from the congestion on the shipping dock caused by waiting loads, 16 manhours were consumed in loading an average car. Unloading at the Norwood Plant, where the units were sorted for storage, took 18 more manhours. The combined handling cost under this method amounted to $2.12 per ton.

The survey resulted in a recommendation for the adoption of a pallet program. This plan, in turn, made it necessary to merge the flow of finished goods (from both buildings) on a uniform basis in one central area, where sorting and palletizing could be done. This meant the segregation of cartons by sizes and types of commodities on pallets. The containers varied from 27 to 48 ins. in length, and from 3½ to nine ins. in thickness. The study therefore included the development of pallet patterns. The outcome of this investigation was a 38″ x 48″ pallet size, which was suitable for about 90 per cent of the production.

Another determining factor was that the 38″ width also fitted between columns in the Norwood Plant without creating dead spaces. (A survey of the Norwood facilities had been made as part of the over-all study.) For the remaining 10 per cent of production a 48″ x 48″ pallet was decided on. This size could also be adapted to a number of uses in our raw material storage department.

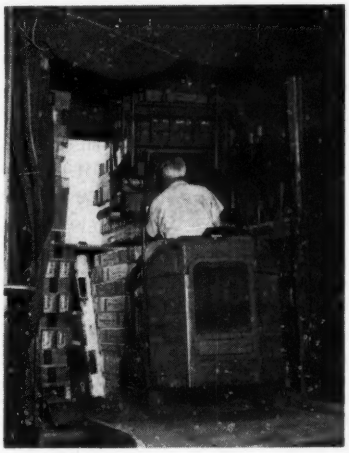
These two sizes met all of our production adequately, though our main concern was of course with the 90 per cent of production. These hardwood pallets (38″ x 48″) are the four-way entry type. Their 48″ width fits two across in a standard freight car, while the 38″ dimension eliminates dead spaces between columns in the Norwood warehouse.

WORK STATION PATTERN in centralized sorting-palletizing room. It adjoins shipping dock.



Layout for Pallet Handling

The flow of finished goods from the two manufacturing buildings (referred to as A and B) was centralized in a former raw material storage room which was adjacent to the rail siding platform in Building A. The flow of goods to this central point was to be by the con-



FORK TRUCK with sideshifter and pusher attachments loads car.

veyor method. Conveyor lines were most adaptable to (a) routing the stream of goods through the available buildings and (b) making delivery to particular points which would be best suited for subsequent fork truck movement.

Accordingly, production from Building B was delivered to the new room in the adjoining plant by a 24″ x 200′ powered belt which traveled at the second floor level above the intervening street through a housing. In Building A the line descended to the ceiling of the first floor. The entire length of this belt conveyor was divided into two lanes by a steel guide to accommodate two types of finished goods. Thus the purposes of sorting was likewise facilitated by conveyor movement.

The complete arrangement is shown in the accompanying layout. One part of the material flow (from Line No. 1) is shunted via chute to the south end of the 50′ x 54′ room. The production from the other half of this belt is delivered on Line No. 2, which is shown in

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14A Series—Tongue Swivel Caster

23A Series—Double Ball Race Swivel Caster

Spring Action Swivel Caster

36A Series—Double Ball Race Swivel Caster

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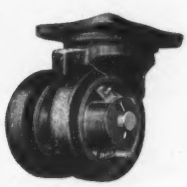

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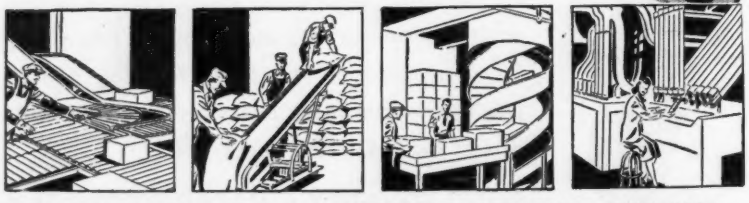

ROLLER - BELT - SLAT - CHAIN CONVEYORS • PORTABLE CONVEYORS AND PILERS • SPIRAL CHUTES • PNEUMATIC TUBE SYSTEMS

the center of the area. Line No. 3 delivers finished goods from the same building along the north wall of the room. (The flow in this particular production department was reversed in order to dovetail this stream of goods with the new layout.) No. 4 is the end of a friction chute which delivers moth-proof bags from an upstairs production department in the same building.

The chute was located along this particular wall in order to balance out the flow of materials to the several palletizing stations, though from a cost standpoint it would have been desirable to locate the chute elsewhere. In other words, in a multi-conveyor layout such as this a contribution to satisfactory working conditions can be made by setting up the lines for an even distribution of work to operators. In this layout, no worker has more activity than any other. The operators' time is divided between high-volume lines and "slower" conveyors. Moreover, the workers can alternate between stations so that each one will also handle an equitable share of the lighter and heavier cartons. Dissatisfaction is thus forestalled.

Other layout modifications included the removal of 50 ft. of bin stores, the relocation of one partition, and the cutting of an extra opening in a wall in order to have a door for each of the two main aisles connecting to the shipping dock. These steps are given in some detail in order to illustrate the types of changes necessary when handling methods are revamped in accordance with modern flow principles.

The New Operation

In the centralized sorting room, three-foot operating aisles are provided for palletization, and 12 ft. truck aisles are maintained on each side of Conveyor No. 2 in the center of the area. The shipping-storage area is 24 ft. wide, and hence all hauls by fork truck are short. Since sorting is done at the same time the goods are palletized at

each station, rehandling in this connection is entirely avoided.

After numerous experiments with car loading, it was decided to purchase a fork truck equipped with a combination side shifter and pusher device. Here is the reason. Because of the short five-mile run to the Norwood Plant, no dunnage is used to fill the empty spaces between the pallet loads and the walls of the car. Instead, our car loading is done in a staggered pattern. While this is contrary to principles developed some time ago, the staggered pattern works well in connection with our goods of relatively low density.

The side shifter spots the loads close against the sides of the car and the hydraulic pusher then presses them snugly against the rear of the car, resulting in a "tight fit." Since the staggered pattern gives an interlocking effect between rows, they tend to support one another. Thus the short empty spaces left at one side of each tier are no problem whatever. The pallet loads, two high, arrive at Norwood without any distortion. Dunnage is of course used in the car door, and this is made up of empty pallets.

The rigid loads built by means of specific pallet patterns contribute to the absence of distortion. Two types of pallet patterns are shown for cartons of different lengths, whose depth and width are the same. For example, care is taken to place the bottom layer of cartons of a certain length in the direction of the car movement. This withstands unusual pressure, while the same pressure would crush the cartons if they were placed in the lateral direction. See the drawings on these pages for details.

With the new method, sorting time has been reduced approximately 66 percent, and loading time per car almost 80 percent. The saving in unloading time at Norwood is comparable. The net handling cost is $1.26 per ton as compared with $2.12 per ton with the previous method.

However, the payload per car has been reduced from 50,000 lb. to

(Turn to page 47)

How *continuously* it works is what counts

ILLUSTRATED HERE is a handling operation which is typical of the work some trucks perform throughout every shift . . . 24 hours a day! Under such circumstances every delay for servicing or repairs means lost time, lost income.

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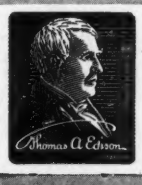

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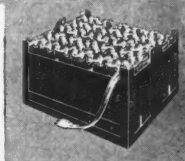

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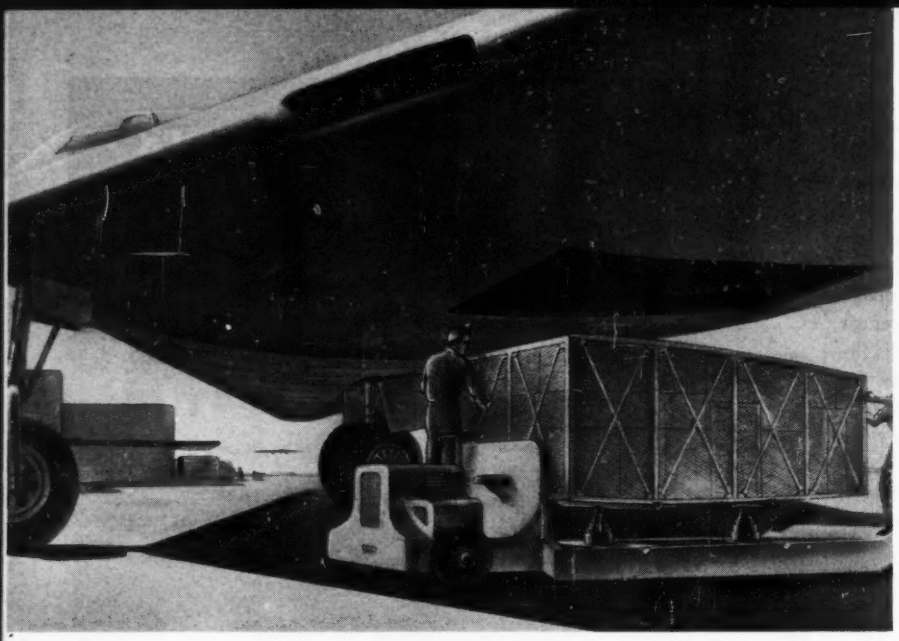


ARTIST'S SKETCH shows handling of preloaded cargo unit from Flying Wing cargo-liner of the future.

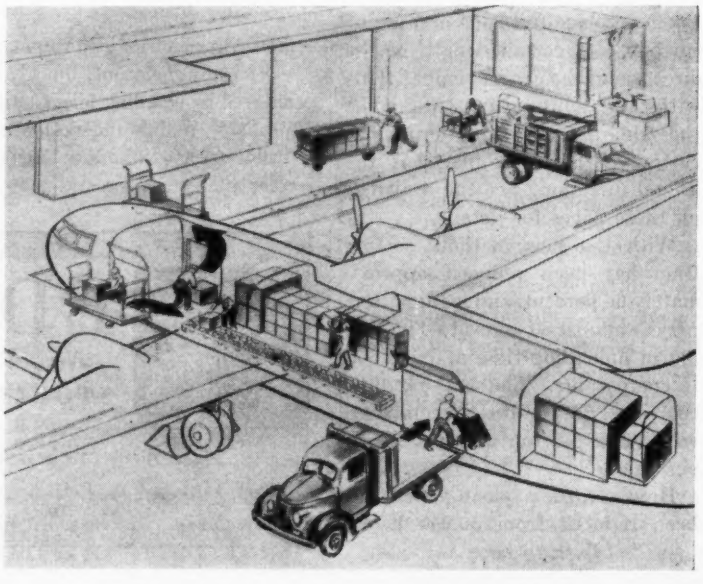
MATERIAL HANDLING

Additional material handling techniques in relation to transport aircraft design are reviewed in this second and concluding installment. While part of these data present developments still in the planning stage, they indicate the pattern of emerging air cargo handling. Experimental ship designs and engineered procedures are promising to realize the long-sought goal of reduced on-the-ground time.

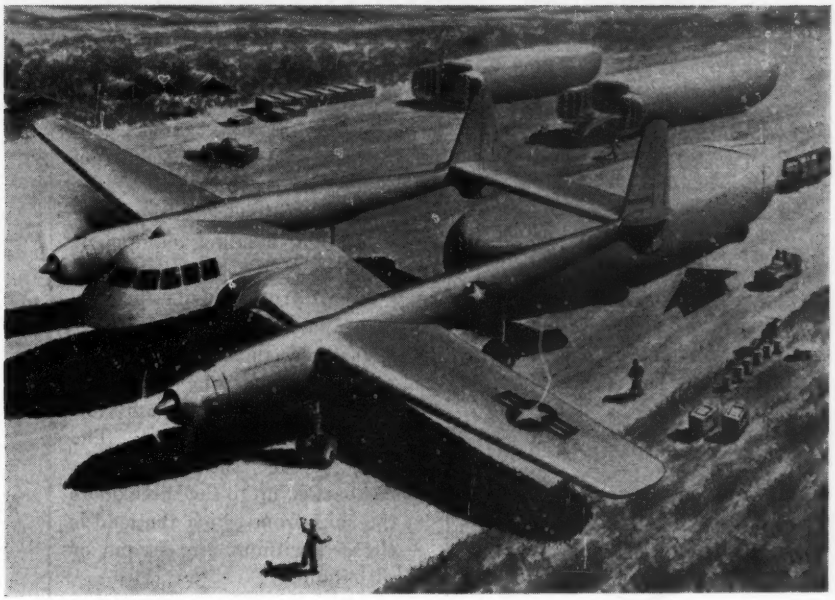
TRANSPORT aircraft designed for near-future operation are incorporating basic material handling techniques and principles. Innovations which seem radical today will seem matter-of-course tomorrow. Handling and rehandling are minimized, and all operations are simplified.

Unitized Cargo Container for Flying Wing

One of the more unusual of the highly advanced transports is an



DOCK-LEVEL cargo floor of CW-32 will employ a variety of standard handling tools.



PACKAGE FUSELAGE (arrow) will be hauled by tractor and flown by motive part of Packplane, according to plans.

IN THE AIR AGE...Part II

adaptation of the familiar Northrop Flying Wing. This tailless design features total enclosure of air crew, engines and cargo space within the wing structure. Its greater speed is an important factor in air freight shipment. The transport version of this design will be divided into individual cargo bays extending spanwise within the wing. This arrangement will enable air cargo handlers to adapt the airborne equivalent of the railroad practice of "cutting out cars" at terminal and intermediate points. Figure 1 shows that the "car" is a unitized cargo container. Since the cargo compartments are individual bays accessible from under the giant wing, preloaded cargo baskets will be used for shipment of "through" or city-to-city loads.

It must be remembered that one persistent drawback of air cargo handling so far has been caused by weight considerations. That is, heavy cargo destined for intermediate points must be stowed under lighter freight, which entails reshuffling in order to discharge a single item. The unitized basket or compartment method will avoid such rehandling.

At loading or unloading points, each pre-loaded freight "capsule" will be lowered and transported from the wing by an industrial type of power truck. (The type of truck illustrated in Figure 1 is an artist's conception of this vehicle.) The same lift truck will reload wing compartments with pre-packaged baskets—in a few minutes. Thus lost time on the ground—a hidden cost factor in all air cargo operations—is being approached with pre-engineered procedures. Northrop officials predict that long-range Flying Wing cargo transports will be in use by 1960.

"Direct" Handling With Standard Equipment

The Curtiss-Wright CW-32 was likewise designed with the basic re-

SPECIAL COLLAPSIBLE pallet box has 32.5 cu ft. volume for mass-handling of small packages.

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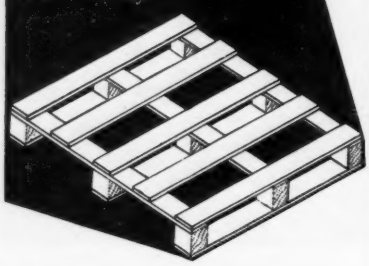

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quirements for economical handling in mind. The physical features of this transport were planned to coincide with those of such ground facilities as highway trucks and railroad cars. As can be seen from Figure 2, the cargo floor is at the standard 45 inches above the ground. The handling equipment is the same as that used in railroad and freight truck depots—gravity conveyors and two-wheel and platform castered trucks. Other equipment will doubtless be applied as determined by the nature and volume of particular cargoes. The artist's sketch shows highway trucks backed up to the three doors of the ship, from which the load is discharged without any second or third handling.

For small-package loads on the CW-32, Curtiss-Wright has developed a collapsible pallet box, shown in Figure 3. This fabric type pallet measures 36″ long by 48″ wide by 32″ high. It has a volume of 32.5 cu. ft. and can be assembled in less than one minute. It is easy to visualize that cargo units of 32.5 cu. ft. volume each will be swiftly unloaded from this transport, whose load capacity is equivalent to that of three standard highway trailers.

The Packplane Incorporates Truck Trailer Principle

The Fairchild C-120, or Packplane, will be the first transport to apply fully the principle of the truck trailer to the airplane. The main fuselage will be detachable (see Figure 4) from the wing and engine assembly and will provide for packaged shipments of goods directly from factory to consumer or user. The C-120 is another advanced design of which only sketches are now available. Production is expected to begin within a year.

The cargo fuselage will be loaded at the factory, and coupled to a truck tractor for movement to the airport. The fuselage will then be uncoupled and attached to the C-120 wing and engine assembly to complete the flight unit. The wing and engine unit, by the way, will

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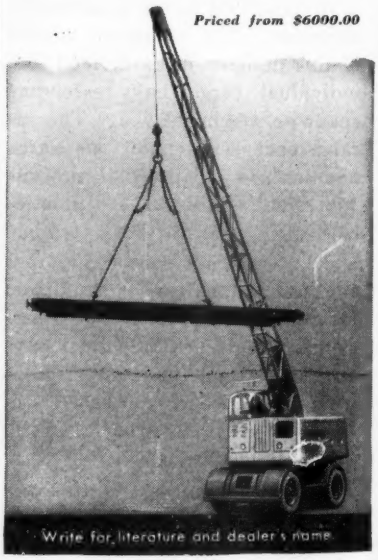

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fly with or without the cargo fuselage.

Arrived at the airport nearest the cargo destination, the fuselage will be delivered by truck tractor to the user's plant or warehouse. Thus the goods will travel from manufacturer to buyer untouched. On the return trip, another loaded fuselage will be flown by the power unit to some point along the line of flight.

While the foregoing applies to "carlot" shipments, other procedures will be designed for mixed or LCL cargoes. These will probably be completed at the airport while the motive portion of the ship continues the flight with another loaded fuselage.

Air Freight Looks Ahead

Thus plans for engineered cargo handling procedures are modifying present and as yet experimental transport designs. In some respects, the modern trend in air freight handling is likewise influencing the design of basic material handling equipment. The special bridge crane shown in Part I of this article is one example among several. Another is the special lift truck visualized in connection with the Flying Wing, which is shown in the present article. At the same time, there remains considerable scope for the application of such standard equipment as floor trucks and gravity conveyors, which are featured in connection with the CW-32. Beyond these considerations of particular types of equipment can be seen the emerging pattern of "mass" handling as exemplified in the prepackaged cargo "capsule" and the detachable cargo fuselage.

The data presented in this two-part article foreshadow the growing importance of air freight—and of engineered handling techniques specially developed for the air freight age. As air freight continues to grow, this field will doubtless also open up a broader area for the application of material handling equipment.

Part I of this article, in the October issue, features several overhead handling devices which are of special interest.

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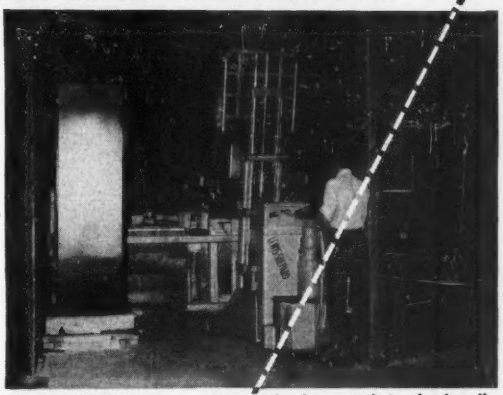

The JACKSTACKER — At a flick of a switch in the handle head this combined electric lift truck and stacker lifts and lowers as it hauls — fits in where heavy fork trucks fail. 5 different models, telescopic and non-telescopic. Caps. to 4000 lbs. Photo shows Counterbalanced, Tilting Model, 3000 lbs. cap. in freight car. Hundreds of other cost-cutting uses for this latest unit in the "MASTER" Line.

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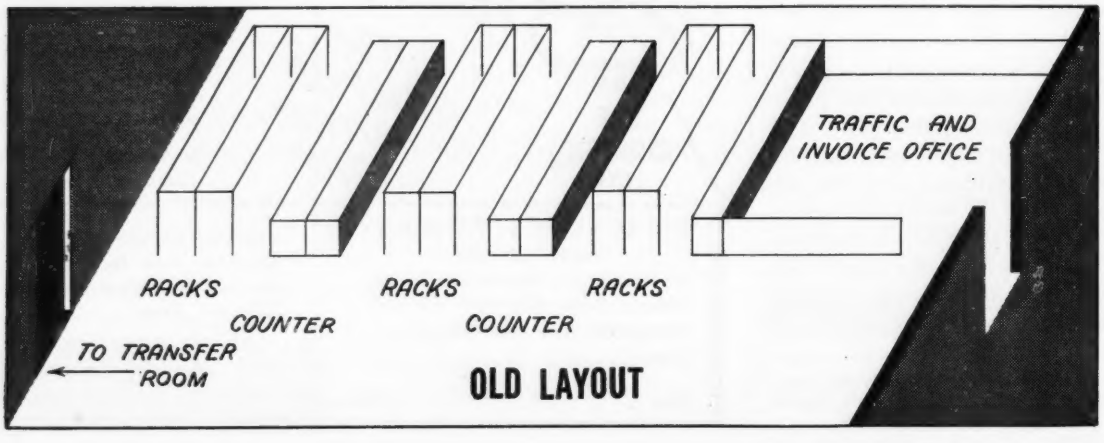
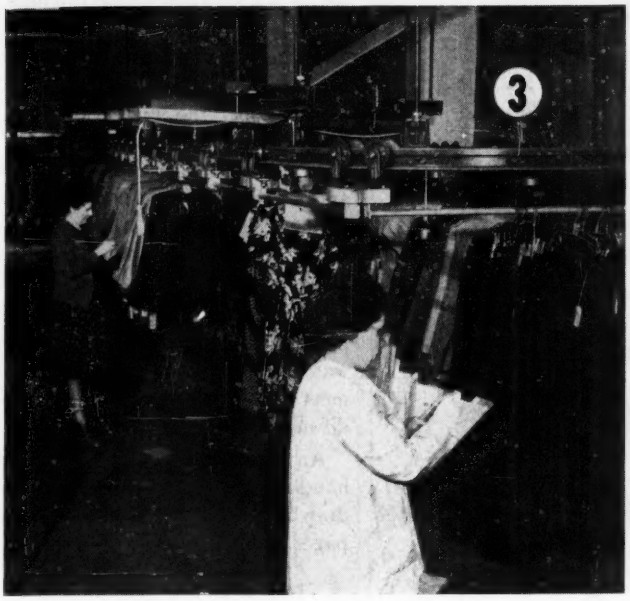
POWER AND GRAVITY CONVEYORS, MONORAIL CARRIERS, CASTERED RACKS

A Department Store Brings Flow To Its Ready-to-wear Operation





3—THE CHECKED merchandise is advanced to reach finally the dispatcher.

4—GARMENTS now go on castered rack trucks for transfer to the s

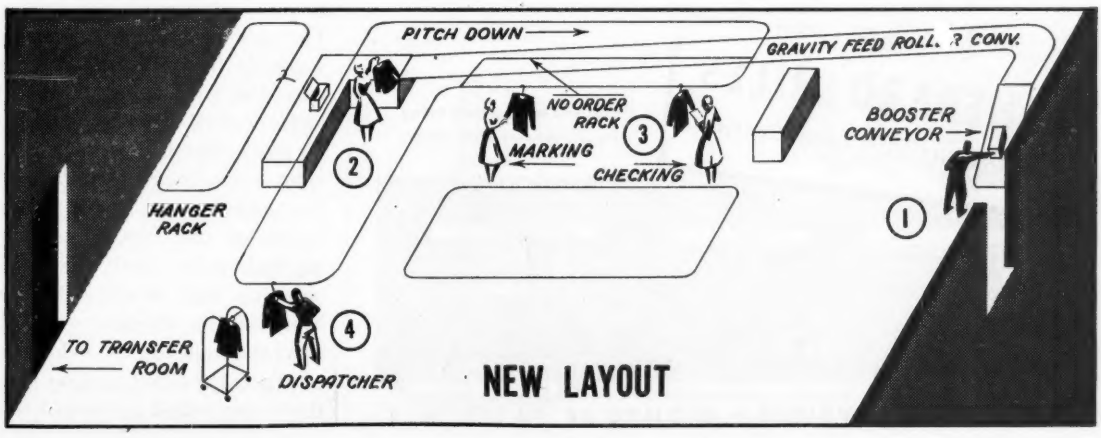
This application of monorail to receiving and marking of ready-to-wear in a retail store is a revolutionary innovation. Engineered handling wrote off the cost of the equipment in one year. This paper was awarded a prize of $100 in the 1948 FLOW Cost Analysis Contest.

By RAY MARAD
Traffic Manager,
Gilchrist Company, Boston

WHEN the Receiving and Marking Room was moved from the store to a remote receiving station, the Ready-to-Wear Section was set up along the conventional department store lines.

This called for a series of counters on which packages could be opened and bins under the counters for the storage of garment hangers. Stationary pipe racks were built adjacent to the counters on which garments could be hung for checking and marking purposes.

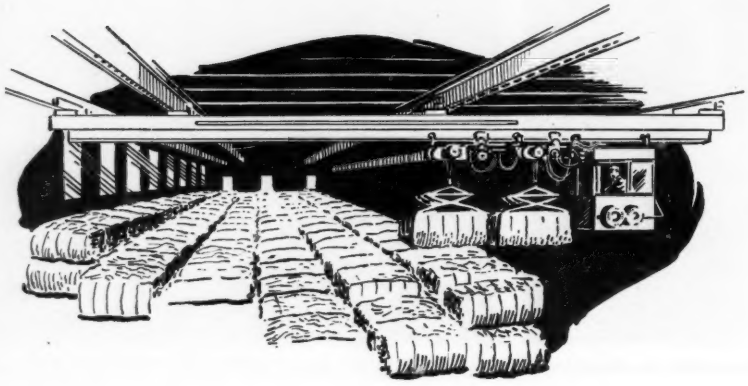
The procedure called for the merchandise to be booked on a four-part receiving apron at the Receiving Section and carted to the counters. A checker and a marker, working as a team, and responsible for a group of departments, would open the packages and hang the garments. The packing slip taken out of the package was pinned to the first garment hung to identify the shipment. The invoice, also taken out of the package, would be forwarded to the Invoice Office to be order checked and retailed. The checker would then



For Better Use of Cubic Volume . . .

For Low Cost Lift and Carrying . . .

STACK FROM THE AIR



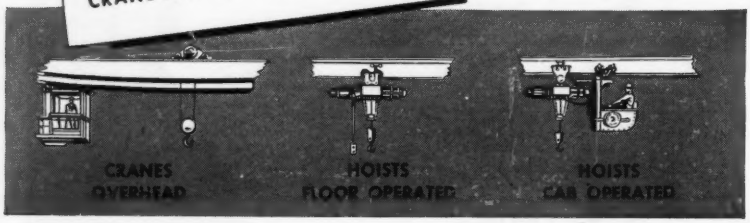
Stacking rolls of paper stock for storage with a "through the air" movement has lowered handling costs and produced more solid stacking in the storage area.

This warehouse picks up the loads *at the door* with overhead equipment, specially designed by Shepard Niles to operate with minimum headroom. No aisle space or turning radii are needed, every cubic foot of area is used for stacking "from the air."

This is one example of the service Shepard Niles specialists can supply to those with materials handling problems. There is economy in knowing where to leave off with one method and take up with the cheaper, faster, safer, "through the air" movement.

SHEPARD NILES
CRANE AND HOIST CORPORATION

Makes and sells all three lifting tools for airborne shop loads.



466 SCHUYLER AVENUE • MONTOUR FALLS, N. Y.

list on the receiving apron the number of garments received by style, color, fabric and size. When the invoice was returned from the Invoice Office, the retail would be entered on the receiving apron, from which tickets could be made and the merchandise marked. The garments were then transferred to rolling rack trucks and forwarded to the main store.

This remote receiving operation proved to be more expensive than was anticipated and too slow to meet the demands of the merchandising division.

An analysis of the procedure and handling methods revealed the drawbacks listed in a box on these pages.

Plan Assembly Line Method

In order to eliminate the above defects and insure speedier flow of merchandise, an assembly-line operation was devised. This assembly-line operation called for the installation of a roller conveyor system to carry packages from the Receiving Section to the Hanging Section, and on either side of the latter two overhead track systems to form separately enclosed loops.

On one loop were 10 three bar pipe racks, suspended from 20 trolleys, on which the different types of garment hangers were sorted. On the other loop, suspended from 60 trolleys, were 30 pipe racks on which the garments could be hung for processing.

The procedure called for the receiving clerk to book the package and, after extracting the invoice, to place it on a booster conveyor. The packages were discharged onto a gravity feed roller conveyor and moved in a continuous flow to the hanging clerks' counter. The hanging clerk would hang garments on appropriate hangers obtained from the three-bar rack, place garments on trolley, and forward to Checking Station, by gravity feed. After checking and retailing the merchandise the checker would forward the trolley to the ticket marker. From the ticket making process the trolley would be pushed to the

marker and then to the dispatcher, where the garments would be transferred to rolling rack trucks and dispatched to the store.

The procedure was also changed to allow for some departments to use prepared lists of standard retails according to standard costs. For those departments which were not allowed to use these lists a switch and inside track was installed to divert the trolleys on the regular loop to the inside rack for storage.

The cost of the installation is as follows:

1. Re-locate counters and hanger benches to form continuous counters for checking other than hanging merchandise	$ 138.00
2. Install gravity feed conveyor with booster	1,072.50
3. Purchase and install overhead track system with appropriate trolleys and racks	1,739.70
Total	$2,950.20

The benefits derived from the assembly operation have proved very gratifying and are featured in a box in conjunction with the listing of the defects that were found.

The Defects That Hampered the Job

1. The carting of packages to the counters, a distance of approximately 90 feet, was slow and at times bogged down because of cross traffic.
2. Piling up of packages on top and around counters resulted in last-in, first-out practices.
3. Piling up of packages made it necessary for girls to lift heavy containers onto counters, causing needless fatigue. In some cases time was wasted in waiting for stockboy to lift packages which girls could not handle.
4. The checkers lost a great deal of time obtaining retails from Invoice office, whereas at the store

*At E. W. Bliss Company it's FOUNDRY PATTERNS

...they're "ROUTINE" for ROSS Lift Trucks

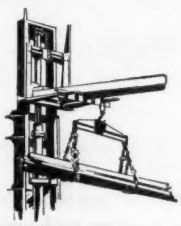
Handling this pattern for the bed of a 1,000-ton press would be a big job for ordinary equipment. Yet it's just "routine" with this ROSS Lift Truck which efficiently and safely transports patterns to and from storage at the E. W. Bliss Company's foundry in Toledo, Ohio.

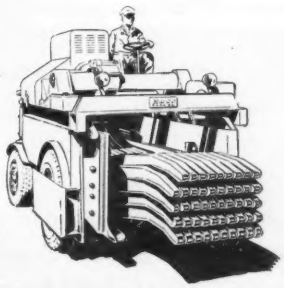
If your plant is typical of most, handling jobs similar to this are a continual problem. That's where ROSS big-load handling efficiency can augment your present equipment, save man-hours and costly delays—very often enough to pay for itself in a year or less.

ROSS Lift Trucks are available in capacities from 5,000 to 18,000 pounds. All have gasoline power and are on pneumatic tires. Write today for complete details and performance data.

BOOM ATTACHMENT for ROSS Lift Trucks

Lift truck can be used as auxiliary crane. No interference with forks. Easily detached . . . Other attachments: scoop, ram, snowplow, winch, side-shifter, slope-piler, etc.





ROSS INDUSTRIAL CARRIERS

. . . straddle the load . . . self-loading and unloading. Five types. Capacities, 10,000 to 40,000 pounds.

Rely On ROSS

THE ROSS CARRIER COMPANY
280 Miller Street, Benton Harbor, Michigan, U. S. A.
Direct Factory Branches and Distributors Throughout the World

buyers had retailed invoices before they were order checked.

5. Lack of orders in Invoice Office caused racks to be loaded with merchandise which could not be retailed. This made it necessary to move merchandise to reserve racks, which delayed the hanging process.
6. Checkers and markers lost time in obtaining tickets from central Ticket Making Office.
7. Marking time was being wasted in locating shipments to be marked on stationary racks.
8. Transferring marked garments on rolling racks in congested areas caused more confusion.

The fact that each clerk became assigned to a single specific phase of the processing resulted in specialization which increased the standard of production with less fatigue.

It is believed that this is the first application of a monorail system in the receiving and marking room of a retail store. This revolutionary method of handling ready-to-wear on an assembly-line basis may be a stepping stone in the further development and wider use of material handling equipment in this type of operation.

How the Defects Were Remedied

1. The cost of installation will be offset by improved production in one year.
2. Defects 1, 2, and 3, as shown above, were eliminated by the installation of the conveyor.
3. Defects 4 and 5 were eliminated by the new retailing method and the addition of a switch and inside track on which no order merchandise could be diverted.
4. Locating a ticket marker on the assembly-line eliminated defect 6.
5. The continuous flow of merchandise on the trolleys from one process to the other eliminated defects 7 and 8.

If it's Bagged,
Put it on the . .
TWINVEYOR
. . FOR FAST
ECONOMICAL HANDLING

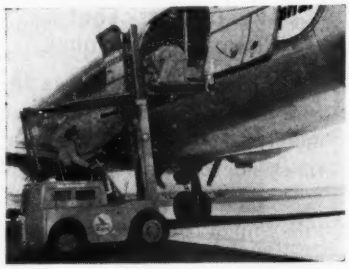
Up to 100 tons of bagged goods an hour at 90 feet per minute—all on a portable twin screw conveyor that can be set up in a few minutes. It's the TWINVEYOR, in 8-foot connected sections that go around curves, up or down grade, to provide smooth, constant flow of bags. Can be taken right into a box car, hold of a ship or to the peak of a warehouse pile.

TWINVEYOR speeds handling yet lowers costs, permits greater use of available floor area, stops traffic confusion, and eliminates floor wear. Put *your* bags on a TWINVEYOR for low-cost handling. Send for catalog giving complete details.

Conveyor systems for every process or operation—complete engineering service for all handling problems.

MHS
MECHANICAL HANDLING SYSTEMS, INC.
Manufacturing Engineers
4620 NANCY AVENUE • DETROIT 12, MICHIGAN
Offices in Principal U. S. A. Cities

LARGEST AIR FREIGHT SHIPMENT—The largest air-freight shipment ever sent from the Twin Cities consisted of American boom-topping winches for cargo vessels operating under the jurisdiction of the Army Transportation Corps. Manufactured by the American Hoist & Derrick Co. of St. Paul, the winches were shipped to the Maryland Drydock Co. in Baltimore aboard a four-engine DC-4 Capital Airfreighter. A pneumatic-tired fork truck loaded this 28,000-lb. shipment into the plane. The winches, mounted on skid platforms, and cases of accessory material, 24 pieces in all, were raised to door-level and placed by the lift truck on the floor of the plane's cargo compartment.—**Courtesy, Clark Equipment Co.**



$2.12 PER TON CUT TO $1.26 . . .

(Continued from page 37)

38,000 lb. This is accounted for both by the pallets and unused spaces (which were formerly crammed full of individual cartons). Of course, the lower cost figure justifies the smaller payload. The total estimated cost of the program, including installation cost of equipment, will be paid from savings achieved in slightly less than one year.

Important Intangible Benefits

A number of collateral advantages developed which could either not be costed or foreseen in their entirety in the planning stage. 1. We expect an increase in the efficiency of order filling at the Norwood Plant because of (a) improved stock locations, (b) absence of congestion and (c) vastly improved elevator service. 2. The accident hazard is appreciably minimized because of (a) fewer handling operations and (b) improved housekeeping and working conditions. 3. Increased Norwood warehouse capacity by 15 percent. 4. Inventory work is considerably facilitated. The job of counting pallet loads is both speedier and more accurate than counting individual cartons.

Palletization facilitated the setting up of time standards and job descriptions by plant engineering, a form of control which did not exist under the old method.

Thus, the adoption of the pallet program, plus the new layout for a centralized sorting operation in connection with conveyor movement, has streamlined the flow of material throughout the plant. The conveyors dispose of production as fast as it comes off the machines. Sorting is done as rapidly as the lines deliver to the palletizing room. Shipping is done as promptly as the loads are palletized. And in the Norwood Plant the material can be unloaded as fast as it is received.

This Crescent

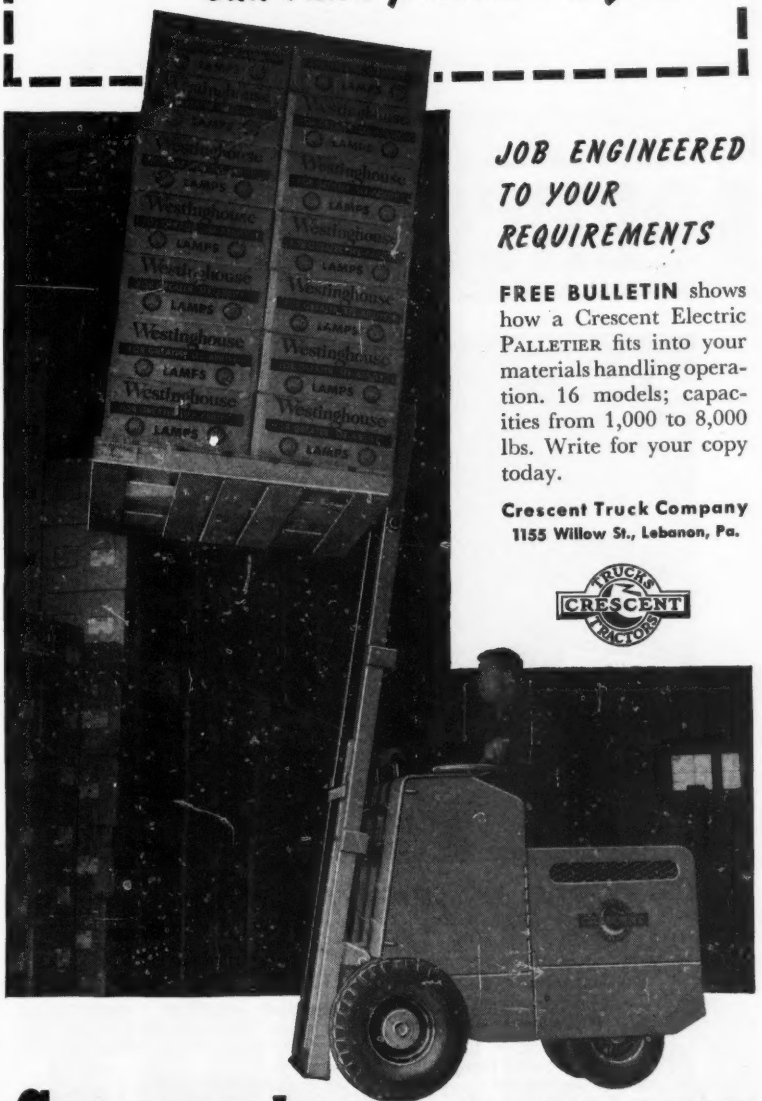
raises profits for Westinghouse

The Crescent Electric PALLETIER does just that in this Westinghouse warehouse in Trenton, N.J. It lifts, hauls, stacks loads high and keeps handling costs low. One operator does the entire job—with ease.

Wherever the PALLETIER is in use, costs decline. Maneuverable and packed with power, the PALLETIER slips in and out of narrow areas, negotiates ramps, cuts terminal time for loading and unloading of carriers.

A Crescent

can raise profits for you



JOB ENGINEERED TO YOUR REQUIREMENTS

FREE BULLETIN shows how a Crescent Electric PALLETIER fits into your materials handling operation. 16 models; capacities from 1,000 to 8,000 lbs. Write for your copy today.

Crescent Truck Company
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ELECTRIC INDUSTRIAL TRUCK AND TRACTOR SPECIALISTS SINCE 1917

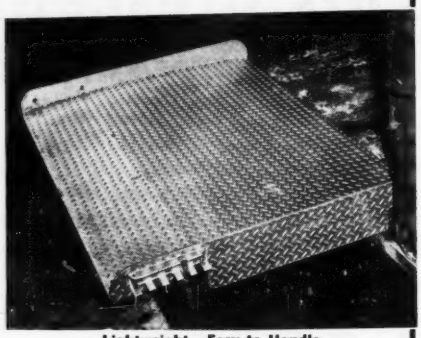
PENCO

IS THE ONLY

MAGNESIUM BRIDGE RAMP

WITH THE

SAFETY LOCKING DEVICE



Lightweight—Easy to Handle

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3,000 lbs. 6,000 lbs. 8,000 lbs. 10,000 lbs.

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OLSON CONVEYORS

SINGLE UNITS—COMPLETE SYSTEMS

Put material handling on a continuous basis with Olson conveyors. In single units or in complete systems, Olson conveyors meet every requirement for lifting, lowering or on-the-level handling. Call Olson today for details on standard or custom-engineered equipment . . . for the answer to your problem through continuous material flow.

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NEW METHODS OF MATERIALS HANDLING may reduce your Cost substantially. Further information without obligation.

GEMAR ASSOCIATES
Greenwich, Connecticut

HOUSES BY CONTINUOUS CONVEYOR FLOW . . .

(Continued from page 29)

The arriving piece parts are unloaded in the south portion of the room and, upon completion of assembly, are then reloaded on the conveyor carriers on the north side.

The assembly benches consist of gravity wheel conveyors, set up in widths of one or more lanes depending on the dimension of the parts, and slope toward the "outbound" strand of the overhead conveyor on the other side of the room. Adjacent to each station are stockpiles of assembly materials. The pallet-fork-truck method is used for a variety of such purchased items, also for hardware and bagged materials required in the enameling plant.

The job of the assembly operators is noticeably facilitated by the "rolling" carrying surfaces of the benches. Panels of the largest dimensions are manipulated with ease as they are variously positioned during the operation. As a means of protecting the enameled surfaces against scratches, the wheels of these conveyor lines are covered with sections of rubber hose.

Each assembly line handles only

a specific component part of the Lustron home. This arrangement simplifies the procedure for the operators at the take-off point from the delivering conveyor. Any operator need recognize only a few parts. The absence of "memory work," in turn, tends to reduce mistakes. With more than 200 different parts arriving from the press department, this simplified job requirement contributes appreciably to accuracy. (It will be remembered that a similar procedure was devised for loading the parts in the press room.)

All Lines Go to One Point

The sanitary ware arriving from the far eastern end of the plant—bath tubs, sink tops, and sinks—are also transported by conveyor across the mezzanine floor and, without being taken off, continue across the bridge to the loading dock.

The cabinet fabricating and enameling department is located at the extreme west end of the mezzanine floor. The first operation on the bulk of the cabinet piece parts takes place in the ground-floor press department, whence the material is delivered on platform trucks via elevator to the higher level. A combination of powered belt and gravity conveyors carries this material (for dinette, kitchen and storage cabinets) through welding and assembly stations, thence by overhead chain type conveyor through the enameling system. After baking, there is no removal or transfer of parts; these items are carried on the closed circuit of this line to the loading point.

Another fabricating and assembly area is to be noted, which is located in Building B. It is indicated on the flow diagram by "structural welding, fabricating and finish." This area extends along the entire south portion of Building B and flanks the packing and shipping line. While the interior and exterior architectural panels constitute the "skin" of the building, the structural steel members make

Master control panel—where time, torque, speed, pressure and vacuum are all read on automatic recording instruments, controlled by photo-electric circuit actuated by the scale.

A new method of testing centrifugal pumps—measuring the volume and time of water flow *by weight with TOLEDOS*—now provides *greater accuracy* in data on pump performance at the Allis-Chalmers plant in West Allis, Wisconsin. Also, time required for the tests is materially reduced.

These Toledos are used in conjunction with an electronic timing device—which provides automatic control of the test, including recording of data. This reduces the possibility of human error and speeds up test work. This method also makes possible the use of Toledo photo-electric controls which "read" the scale and take the test points automatically. Now, measuring by weight proves far more accurate than any former method.

Control your costs and quality with TOLEDO all the way . . . in weighing, counting, force-measuring, batching or testing . . . and to provide the vitally important ACCOUNTING facts on receiving, shipping and production.

Send for bulletin 2020 . . . a special presentation of Modern Weight Control. Toledo Scale Company, Toledo 12, Ohio.

TOLEDO SERVICE as near as your telephone . . . with factory-trained service men in more than 200 cities of United States and Canada.

TOLEDO

HEADQUARTERS FOR SCALES

One man and a C-F Lifter . . .

One man and a C-F Lifter handle the sheet steel stock in and out of storage in this plant with ease, speed and economy. C-F Lifters can pick up, carry and unload more loads per hour using less man and crane time than any other method. Note how closely a C-F Lifter piles sheets—this results in great savings in storage space. Jaw adjustments for carrying different widths of sheets are made in a few seconds by the operator—an important feature when varying sizes of stock are used.
C-F Lifters are made in sizes to handle from 2 to 60 tons in standard and semi-special designs.

Write for the bulletin "C-F Lifters." It illustrates the many cost saving advantages of these lifters.

CULLEN-FRIESTEDT CO.
1320 S. Kilbourn Ave., Chicago 23, Ill.

Cut handling costs *outside* your shop with ROUSTABOUT CRANES

. . . The fast tractor-footed load hustlers

● Don't stop with factory trucks—get the same materials handling efficiency and savings in your yard with a Roustabout. It's speedy, versatile, handles loads to 7½ tons, hook or magnet, year round anywhere. Ruggedly built for years of overwork. Hundreds of users. Make your yard contribute to profits, too—get the Roustabout economy facts now.

Write to Dept. C-6

HUGHES-KEENAN CORPORATION
DELAWARE, OHIO, U. S. A.
Load-Handling Specialists since 1904

up the hidden framework. The latter includes wall sections and roof trusses, which are considerably bulkier and heavier than the architectural panels. These sections are likewise carried by an overhead chain conveyor system through equipment where they are automatically cleaned, bonderized, painted and dried. Loading and unloading of the roof trusses onto and from the process conveyors is accomplished by electric hoists.

Special equipment had to be designed for handling these bulky members through numerous processing steps at the same production rate as in Building A. One reason this operation was located here is because the finishing system requires almost 800 ft. in line; moreover, upon completion these relatively heavy members are close to the ultimate point of use. (Like the architectural panels, they are later loaded on the delivering highway trailers in specially designed compartments.) Final assembly on the structural members (for plumbing and electrical accessories) is done in an area in the load line, which makes these units available for loading without the need of further transportation.

The Conveyor Work Carriers

In any operation where many types of components are transported on a conveyor system, it is of utmost importance to have work carriers that will (a) carry the parts securely, (b) utilize conveyor capacity to best advantage, (c) avoid damage to vulnerable material, and (d) make for easy loading and unloading, and thus safety to operators.

A universal type of basket (slightly modified for certain parts) carries about 50 per cent of the internal and external panels on the transport conveyors. A typical design is shown in a drawing on these pages. This unit is 30″ wide, 55″ deep, and 108″ high. The frame consists of ⅝″ tubing and will support a load up to 1000 lb. The width is divided into three compartments,

with a shelf for each section. The sides and bottom consist of expanded metal. The center compartment accommodates architectural panels eight ft. long (the longest ones made), while the two outboard compartments are designed for various types of shorter panels. Seven hundred of these baskets are in use. Modification of the basket involves only changes of detail—special arrangement of shelf space, for example—and not changes in the basic design.

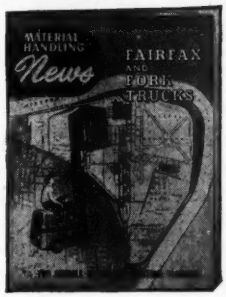
Special adapter hooks were designed for the large volume of roof panels, 4″ x 4″ ceiling panels, and gable end panels. These are simple hooks, on which most of these components are suspended by their flanges. These are the two main types of work carriers used in conjunction with the transport lines. Special adapters are of course used for the process conveyors traveling through the pickling machines, furnaces, and where processing requirements indicate them.

The work carriers on the transport conveyors are spaced on 10′ 8″ centers, which at a travel rate of 20 FPM maintains the requisite volume to meet the production schedule.

Homes Via Synchronized Flow

Literally scores of separate conveyor lines make up the mile-long, plant-wide system, all synchronized to deliver the numerous types of components in the desired colors at the required production rate to the load line. As mentioned, the bulk of the raw fabricated parts travels from the press department west to east through the enameling plant, while the sanitary ware is initially conveyed a short distance from east to west. Then all parts flow north via the mezzanine section, where cabinet fabrication and processing likewise take place. The material flow continues to Building B, where the heavier structural members originate and are finished, and ends adjacent to storage locations from which the outbound highway trailers are loaded. (See page 62.)

HOW Big Businesses are using CLARK Methods and Machines as the quick, sure means **TO** lower that all-important break-even point, and the amazing extent to which they **SAVE** production time, human effort, storage capacity and **MONEY**



— are described and pictured in the MATERIAL HANDLING NEWS

* This stimulating "tell how" magazine, and Clark's invaluable "show how" motion pictures, rich with proved money-saving ideas that *you, too, can use,* will be sent to you at no cost. No obligation! Simply request them on your business letterhead.

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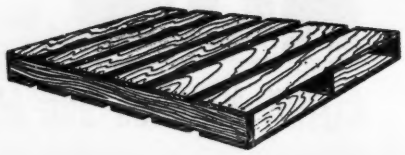
INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 13, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

THE NATIONAL GUARD DEFENDS AMERICA—JOIN NOW

ON THE  PALLET

NEWS • VIEWS • TRENDS

A. FLODIN, president, Lake Shore Engineering Co., has announced formation of a conveyor division of the company to manufacture and sell Tote-All and Coaltoter lightweight, power-driven portable belt conveyors for handling bulk and packaged materials. These machines were formerly manufactured by Material Movement Industries, Inc., which will now be dissolved.

THE ENGINEERING DIVISION of the Technical Association of Pulp and Paper Industries held its annual meeting at the Statler Hotel, Boston, October 31 through November 2. The subject of material handling was one of the major features. The Material Handling Committee of the group sponsored a formal paper by S. L. Foster, chief engineer of the Kalamazoo Vegetable Parchment Co. It covered many case studies of conveyors as applied to the pulp and paper industry.

RUMSEY-PERKINS AGENCY, Chicago, has been appointed advertising agency for the Union Steel Products Co., Albion, Michigan. Among the products manufactured by the company are wire storage and shipping containers.

THE National Wooden Pallet Manufacturers Association sponsored a conference of wooden pallet manufacturers on September 27, 28 and 29 in New York City. On the first day, those in attendance were guests of the U. S. Army Transportation Corps on an inspection tour of the New York Port of Embarkation. This afforded the group a first-hand opportunity to see wooden pallets in action in the loading and handling of overseas cargo, as well as to inspect the pallet repair shop operated by the Transportation Corps at Brooklyn. The program on September 28 was devoted to a conference on the problems confronting the industry and included the question of pallet patents. On the final day, members were guests of the U. S. Naval Supply Research and Development Facility at Bayonne, New Jersey, where a tour was made of material handling development and testing operations.

THE Gould Storage Battery Corp. is conducting a week-long school for battery maintenance men. The course, the 23rd in Gould's long-term program of manufacturer instruction to battery users, will be held November 14 to 18 at the company's Trenton plant. The school will include instruction in storage battery theory. battery design, electrical theory, battery layout, charging methods and maintenance procedures. Laboratory projects and demonstrations for students will include assembling a complete cell and rebuilding a battery; charging batteries by different methods; setting up charging controls and schedules; and repairing damaged batteries with proper tools and correct carbon-arc burning techniques. Seventeen lectures by experienced field engineers and outside consultants will be presented. Presentations will be mimeographed and given to students for future reference on the job. Inquiries for additional information and reservations should be addressed to J. A. Gilruth, school director, Gould Storage Battery Corp., Trenton, New Jersey.

CHAIN BELT CO. has announced the opening of a modern warehouse in conjunction with newly expanded facilities for the Dallas district sales office at 1611 Dragon St. Located only a short distance from the Dallas business district, it is convenient and accessible with ample parking space.

YOU hear much about material handling equipment—how fork trucks and pallets cut the loading cost $20 per car or reduce the unloading job from $38 to $8. And so on. These are the obvious situations being corrected at most plants. But the hidden costs of material handling may offer greater opportunity. Perhaps machines can be arranged to transfer the materials directly from one unit to another, or perhaps they can be pumped or blown with no handling whatever. In addition, the uniform flow may set the production pace, a further saving. Handling-in-process is seldom recognized as material handling—cost systems treat it as part of process labor. Yet these costs can be high, especially when the operators are top paid machinists. Any hand movement of materials in process or assembly is costly, sometimes running from 5% to 20% of the man-hours.—*Adapted from a statement by the National Industrial Conference Board published by Ford, Bacon & Davis, Inc.*

FLIES that help catch fish are now held by magnets. A new fly-box for fishermen, which incorporates a rotating G-E Alnico permanent magnet, will hold an

(Turn to page 81)

MEN IN THE NEWS

C. J. MOORE, manager, Pittsburgh branch, has been appointed manager of Exide's Railway and Motive Power Sales Division, it is announced by The Electric Storage Battery Co. Moore was previously supervisor of Motive Power Sales from 1942 to 1946 when he was transferred back to the Pittsburgh Branch as assistant manager. Shortly after he was appointed manager. Moore entered the company in 1935 as a salesman in the industrial department of the Pittsburgh branch. Prior to his employment by Exide, he was with The American Telephone and Telegraph Company, and a consulting engineering firm. He is a member of the American Material Handling Society.

APPOINTMENT of C. H. Leet as manager of the Exide Pittsburgh branch has been announced by The Electric Storage Battery Co. Leet entered the company in 1938 as a salesman in the industrial battery department in Pittsburgh. Prior to entering the service of the company, he was with the General Electric Co.

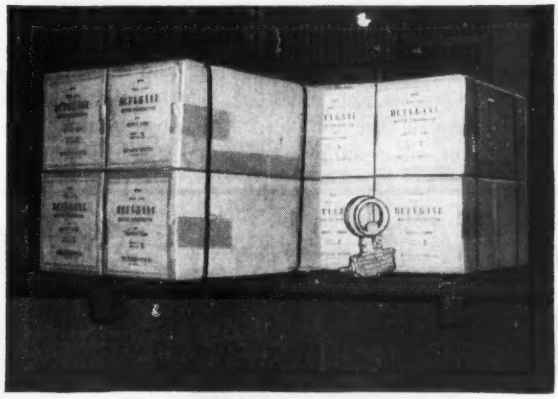
S. J. WOODWORTH has been appointed sales manager of the Wright Hoist Division of American Chain & Cable Co., Inc., with headquarters at York, Pennsylvania. He succeeds A. R. Haskins, who has resigned. Woodworth has been with the Division for over 25 years, and has had wide experience with hoisting applications and materials handling problems.

W. C. KENNEDY has been appointed general sales manager of Airquipment Co. and Aerol Co., Inc., subsidiaries of Lockheed Aircraft Corporation. Announcement was made by Newman L. Smith, president of the two companies.

J. C. FINK, formerly manager of the industry engineering department of the Westinghouse Electric Corp., has been named assistant to A. C. Monteith, vice president in charge of engineering. In 1948 he was named manager of the entire industry engineering department and served in that capacity until his present appointment.

Cut express charges by bundling shipments with

ACME STEELSTRAP



THE TEST SHIPMENT that proved a saving! Four cartons bundled as an Acme Uni-Pak.

Read how one shipper saved 43%!

Octo-Gane carburetors, made by Exola Products, Inc. of Los Angeles, are packed for shipment in 5-pound cartons. Before an Acme Shipping Specialist suggested bundling 4 cartons into one package, Exola shipped them separately and was charged on the basis of a 10-pound minimum for each carton.

Bundling with Acme Steelstrap made a big saving! In a cost comparison test, 4 cartons shipped singly cost $4.01 in express charges. The Acme Uni-Pak bundle of 4 cartons cost only $2.26—a cash saving of 43%!

This money-saving idea might well be applied *right now* to your shipping operation. But it is only one of the ways in which Acme Steelstrap and Unit-Load Band are saving time, materials, and money for thousands of users.

Acme Shipping Specialists know other cost-cutting solutions for your shipping problems. Ask for a free analysis—or for a free booklet of case studies—by using the coupon below.

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ACME STEEL COMPANY

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ACME STEEL CO. CHICAGO

ACME STEEL COMPANY, Dept. F-119
2838 Archer Avenue, Chicago 8, Illinois

☐ Send free booklet, *"Savings in Shipping."*
☐ Have representative call.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

UNITIZING PAPER BAG SHIPMENTS . . .

(Continued from page 31)

may be easily separated vertically but cannot be moved horizontally.

Even in cases where units will not withstand strapping and distortion, sufficient rigidity and support must be built into them or the bales to prevent serious indentation or collapse of the bundles, or parts of them, when subject to the weight and pressure of other pallet loads which may be stacked on them.

Loading and Securing for Shipment

This is one of the most difficult elements of this type of palletizing to gauge properly. Individual bales must not be baled too tightly, thereby preventing bags from opening and filling readily; yet a sufficiently solid bundle must be made to absorb and transmit pressure and weight.

In order to take fullest advantage of palletizing, it is axiomatic that the loading of carriers be such as to eliminate extra handling and delays. When set in the freight car, the loads must be secured so that they cannot shift or break in transit. A system of strapping has been worked out that enables such loads to travel with virtually no shifting.

Fast pallet handling also applies to unloading cars. On arrival of the shipment, the fork lift truck should be able to remove the doorway pallets without difficulty. Once these are out of the way, there must be sufficient space to give access to the remaining loads.

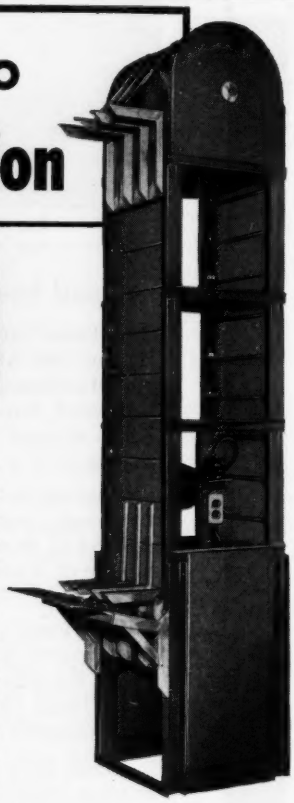
The ultimate development of palletizing paper bags for shipment will depend upon the economy with which other satisfactory methods can be worked out. Experimentation is continuing. Potential savings are great. While actual savings vary in different plants, there is no doubt that the methods described here will effect substantial economies in almost any bag packing operation where fairly large shipments of bags are involved.

(The data and exhibits for this paper were furnished through the courtesy of the Bemis Bro. Bag Co., St. Louis, Missouri.)

A *NEW* WAY TO

Raise Production

with STEEL-PARTS STEEL BELT **Elevating** CONVEYOR



Now . . . a NEW way to raise production and employee efficiency . . . to cut unit cost and operating space! STEEL-PARTS new ELEVATING steel belt conveyor is unbeatable for sending parts or packages from floor to floor in a continuous flow . . . .lifts packages up or down . . . loads or unloads at desired height. Incorporates all of the famous features of STEEL-PARTS standard models. Let STEEL-PARTS engineers make specific recommendations concerning your materials handling problems. Mail the coupon today!

ENGINEERING DATA

- **BELT**—heavy 18 gauge steel.
- **WIDTH**—12 inches to 30 inches.
- **LENGTH**—5 feet to 30 feet.
- **SPEED**—Up to 50 feet a minute.
- **H.P. REQUIRED**—½ to 2 horsepower.
- **LOAD LIMIT**—(recommended) 50 lbs. per arm. This can be exceeded 50%.
- **PULLING LOAD LIMIT**—1000 pounds.
- **ARMS**—18 inch maximum length. Can carry a load up or down.

STEEL-PARTS MANUFACTURING CO.

DIVISION OF BLACKSTONE MANUFACTURING COMPANY

STEEL-PARTS MFG. CO. FLOW—NOV.
4630 W. Harrison, Chicago, Ill.

Please send me complete information including engineering data and specifications on your Steel-Belt Conveyors.

Please have your representative call to discuss our specific materials handling problems.

NAME_____ POSITION_____

FIRM_____ ADDRESS_____

CITY_____ STATE_____

THE SAME CONSIDERATIONS of economy apply to handling bagasse in the fields of Louisiana as to the moving of an ingot mold in Pittsburgh or barrels of flour in Minneapolis. Nearly 3000 lb. of baled bagasse are about to be picked up by these automatic tongs and delivered to the storage stack seen behind the small railroad cars. The tongs are suspended from a 50-ft. boom mounted on a tractor. The stacks pictured in the background frequently

hold 1000 tons of the fibrous material left over after juices have been extracted from sugar cane. Bagasse is fabricated by The Celotex Corp. into rigid insulating building board and other cane fibre building materials.—**Courtesy, Heppenstall Co.**

FLOW ENGINEERING DATA PAGE

A regular feature designed to help the engineer and others responsible for material handling. The FLOW Engineering Data Page will cover a different category of equipment each month.

(From the 1949-50 FLOW Directory of Material Handling Equipment, Machinery and Accessories)

HORSEPOWER REQUIRED TO ELEVATE MATERIAL

Tons Per Hour	Lift in Feet 5	10	20	30	40	50	60	80	100
10	.05	.10	.20	.30	.40	.51	.61	.81	1.01
25	.13	.25	.51	.76	1.01	1.26	1.52	2.02	2.53
50	.25	.51	1.01	1.52	2.02	2.53	3.03	4.04	5.05
75	.37	.76	1.52	2.27	3.03	3.79	4.54	6.06	7.57
100	.51	1.01	2.02	3.03	4.04	5.05	6.06	8.08	10.1
125	.63	1.26	2.52	3.79	5.05	6.31	7.58	10.1	12.6
150	.76	1.52	3.03	4.54	6.06	7.57	9.09	12.1	15.2
175	.88	1.77	3.54	5.30	7.07	8.84	10.6	14.2	17.7
200	1.01	2.02	4.04	6.06	8.08	10.1	12.1	16.2	20.2

CAPACITY OF APRON CONVEYORS IN TONS PER HOUR AT 10 FT. PER MINUTE

(Loading to 75% of maximum cross section; material weighing 50 lbs. per cu. ft.)

Actual Width of Carrying Surface (Inches)	Average Depth of Material (Inches) 2	3	4	5	6	7	8	10	12	14	16	18
18	2.8	4.2	5.6	7.0	8.4	9.8	11.3	14.1	16.9	....	....	....
24	3.8	5.6	7.5	9.4	11.3	13.1	15.0	18.8	22.5	26.3	30.0	33.8
30	4.7	7.0	9.4	11.7	14.1	16.4	18.8	23.4	28.1	32.8	37.5	42.2
36	5.6	8.4	11.3	14.1	16.9	19.7	22.5	28.1	33.8	39.4	45.0	50.6
42	6.6	9.8	13.1	16.4	19.7	23.0	26.2	32.8	39.4	45.9	52.5	59.1
48	7.5	11.3	15.0	18.8	22.5	26.3	30.0	37.5	45.0	52.5	60.0	67.5
54	8.4	12.7	16.9	21.1	25.3	29.5	33.8	42.2	50.6	59.1	67.5	75.9
60	9.4	14.1	18.8	23.4	28.1	32.8	37.5	46.9	56.3	65.6	75.0	84.4

HORSE POWER REQUIRED TO CONVEY MATERIAL HORIZONTALLY

(These figures apply only to the transfer of material, and do not include the machine.)

Tons Per Hour	Horizontal Length of Conveyor in Feet 25	50	100	200	300	400	500	600	800	1000
10	.05	.06	.08	.11	.14	.17	.20	.23	.29	.35
25	.13	.15	.19	.27	.34	.42	.49	.57	.72	.87
50	.27	.30	.38	.53	.68	.83	.98	1.14	1.44	1.74
75	.40	.45	.57	.80	1.01	1.25	1.47	1.70	2.16	2.61
100	.53	.61	.76	1.06	1.36	1.67	1.97	2.27	2.88	3.48
125	.66	.76	.95	1.33	1.70	2.08	2.46	2.84	3.60	4.35
150	.79	.91	1.14	1.59	2.04	2.50	2.95	3.41	4.32	5.22
175	.93	1.06	1.33	1.86	2.39	2.92	3.45	3.98	5.04	6.10
200	1.06	1.21	1.52	2.12	2.72	3.33	3.94	4.55	5.76	6.96

DUMPING ANGLES

ANGLES AT WHICH DIFFERENT MATERIALS WILL SLIDE OUT OF TIPPED BODY

MATERIAL	ANGLE, degrees	MATERIAL	ANGLE, degrees
Ashes, dry	33	Earth, loose	28
Ashes, moist	36	Earth, compact	50
Ashes, wet	30	Garbage	30
Asphalt	45	Gravel	40
Brick	40	Ore, dry	30
Cinders, dry	33	Ore, fresh mined	37
Cinders, moist	34	Rubble	45
Cinders, wet	31	Sand, dry	35
Cinders and clay	30	Sand, moist	40
Clay	45	Sand and crushed stone	27
Coal, hard	24	Shingles	40
Coal, soft	30	Stone	30
Coke	23	Stone, broken	27
Concrete	30	Stone, crushed	30

Institute, Society and Association Chapter Activities

THE first fall meeting of the Syracuse Chapter of the American Material Handling Society was held on September 20 in Sherrill, New York. The group toured the Oneida Ltd. tableware plant as a main feature of the program. Each visitor was given a sheet of paper, prior to the plant tour, on which to write his suggestions for improved handling. These suggestions were collected at the end of the tour and each one was read out loud and discussed. Oneida's Works Manager M. W. Keller passed on the suitability of each idea offered. This panel discussion was stimulating both to Oneida Ltd. representatives and to the visitors.

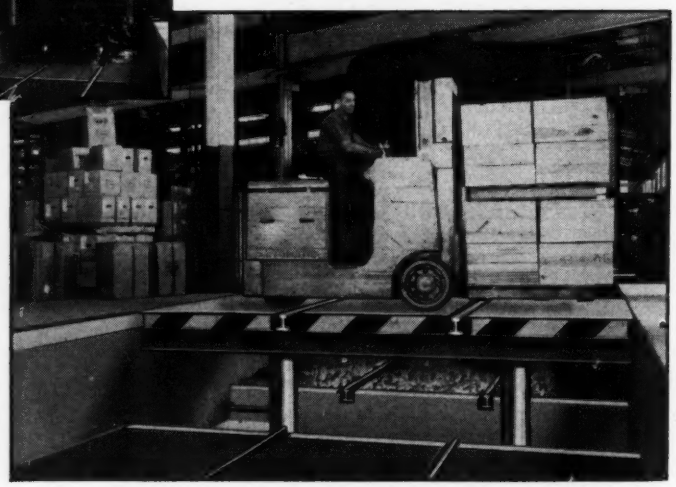
Officers of the group are Donald W. Pennock, president; Harold A. Carey, vice president; Victor E. Hall, secretary; and Willard D. Ackley, treasurer.

DR. EARL W. PLANTY, executive counselor of Johnson and Johnson, New Brunswick, N.J., addressed the Material Handling Society of New Jersey at its first meeting of the fall season on September 21. The meeting was held at the Military Park Hotel, Newark. Planty's subject was "Human Relations Engineering for Material Handling Problems." Although it was organized less than one year ago, the Society has over 100 members. This year's schedule lists many informative talks by leading material handling men as well as a field inspection trip to a newly completed distribution warehouse. Officers of the group are: president, R. A. McDonough; vice president, C. L. Lockhart; and secretary and treasurer, L. Landenberger.

MORE than 60 persons attended the first fall meeting of the Northeastern Ohio Chapter, Cleveland. The meeting was held September 15. W. W. Phillips and R. A. Pigg of the Eli Lily Co., Indianapolis, were featured speakers. A discussion of battery-powered vs. gasoline-operated fork trucks was presented. Chapter business was election of officers for the 1949-50 season. They are Roy Stevenson, Lamson-Sessions Co., president; Frank C. Weir, Timken Roller Bearing Co., vice president; Tom Stringer, Thew Shovel Co., treasurer; and Frank J. Young, C & D Batteries and Motor Generator Corp., secretary.

THE Caster & Floor Truck Manufacturers Association, the Electric Industrial Truck Association, the Material Handling Institute and the Association of Lift Truck & Portable Elevator Manufacturers held a joint meeting October 12 to 14 in Cleveland. In addition, each association held separate meetings.

Globe Bridge Lift



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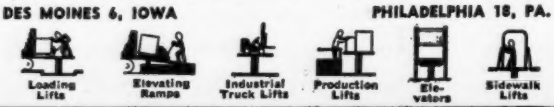

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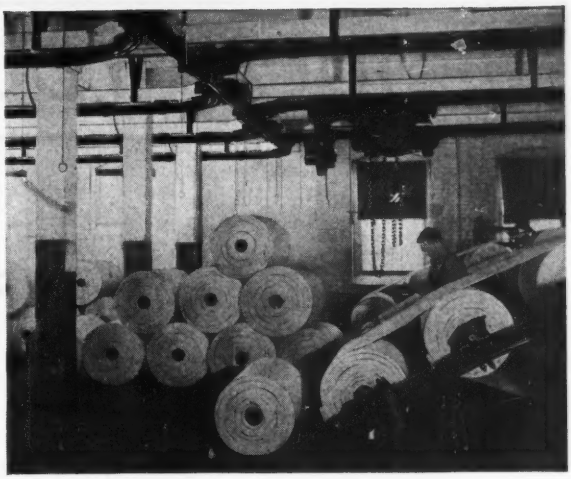

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If your processing operations call for lifting or moving of loads up to 3000 lbs., Coburn can eliminate many "back-breaking" problems.

The sectional design of Coburn Enclosed Overhead Monorail permits easy installation, rearrangement or extension, as required. It can be used with hand or electric hoist; does not obstruct floor space; requires very little headroom; permits easy spotting of work directly over machines.

Write today for catalog showing full details on Enclosed Track, Bracket-Type Jib Cranes, Travelling Cranes and Monorail installations.

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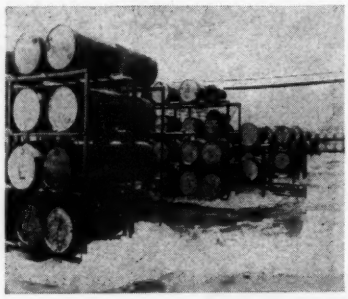
IDEAS YOU CAN USE

Tested Techniques For Better Production

TRUCK WITH A 62-FT. LIFT—A new type lift truck has been completed and shipped to the government shale oil mine near Rifle, Colorado. Built on order of the government, the machine, a telescope lift featuring a scaffold rather than earth moving or cement work attachments, was built to enable miners to work at heretofore inaccessible places at the Colorado mine. The new equipment has been designed for extreme maneuverability and roadability. Its compact scaffold-bearing hoist will fold to a mere 12′ 8″ over the cab of the unit. The hoist while nested is only 20 ft. in height and will extend to 62 ft., believed the highest extension ever attempted on any type of lift-truck equipment. The vehicle has a powerful 92 H.P. diesel engine and is hydraulically operated with the exception of the cables which lift and lower the hoist. The scaffold itself is approximately 3′ x 12′ with adequate safeguard rails.

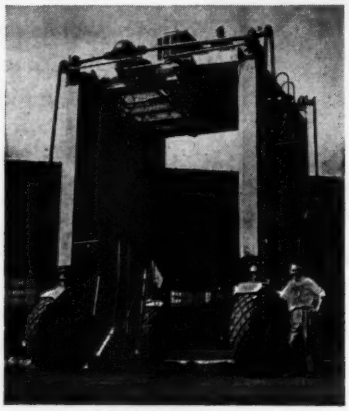
Although it was designed for use of two men, the scaffold can be enlarged to accommodate any specified number of personnel. A safety feature of the scaffold is a remote control lever which enables workers to lower themselves.—**Courtesy, Mixermobile Manufacturers.**

OUTSIDE-INSIDE STORAGE RACKS—The illustration shows how drums are compactly stored and easily removed by means of a storage rack system at the vast Sinclair Research Laboratories, Harvey, Ill. The drums contain samples of various materials and experimental products used in the permanently established program of Sinclair Refining Co. As shown in the



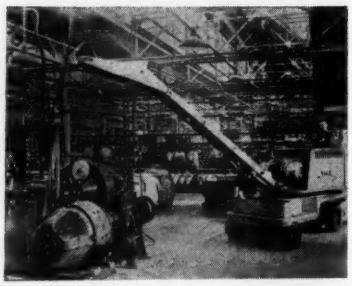
photo, part of the storage racks, which have a total capacity of 300 drums, are located outside the building; the remainder inside. A portable elevator and a fork truck are employed for placing and removing the drums. The racks are designed to make any drum immediately accessible. Materials may be drawn from any drum without its removal from the rack, or disturbing others.—**Courtesy, Barrett-Cravens Co.**

WORLD'S LARGEST STRADDLE TRUCK—The largest vehicle of its type



ever built is in use at the Southern Wood Preserving Co., Chattanooga, Tenn. Capable of handling loads 16-ft. high and 9′ 4″ wide, the unit has a capacity of 20 tons. Completely mobile and self-propelled, it rolls on heavy duty 16.00 x 24 pneumatic tires and incorporates four-wheel drive and four-wheel hydraulic booster steering. It loads and unloads a fleet of tram cars and handles all railway ties—approximately 120 green hardwood cross ties per load. The straddle truck transports the loads to the huge storage yard and from the yard to the adzing and boring mill after seasoning. — **Courtesy, The Ross Carrier Co.**

MAINTENANCE WORK KEEPS IT BUSY—By utilizing the crane truck during its idle periods, (1) hand lifting is eliminated; (2) special rigging and scaffolding are done away with, and (3) time is saved when heavy equipment (such as the motor shown) must be lifted for maintenance and repair operations. The crane truck can set



the load on plant vehicles for transportation to the shop, or, where conditions permit, carry it to destination. The vehicle also is used for servicing overhead fixtures such as lights, heaters, electrical conduit, and pipe lines; the boom of the truck can be fitted with a platform, and a man can be raised to reach overhead spaces. This technique eliminates the necessity for scaffolding and special equipment for reaching overhead units.—**Courtesy, The Yale & Towne Mfg. Co.**

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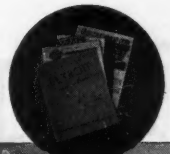

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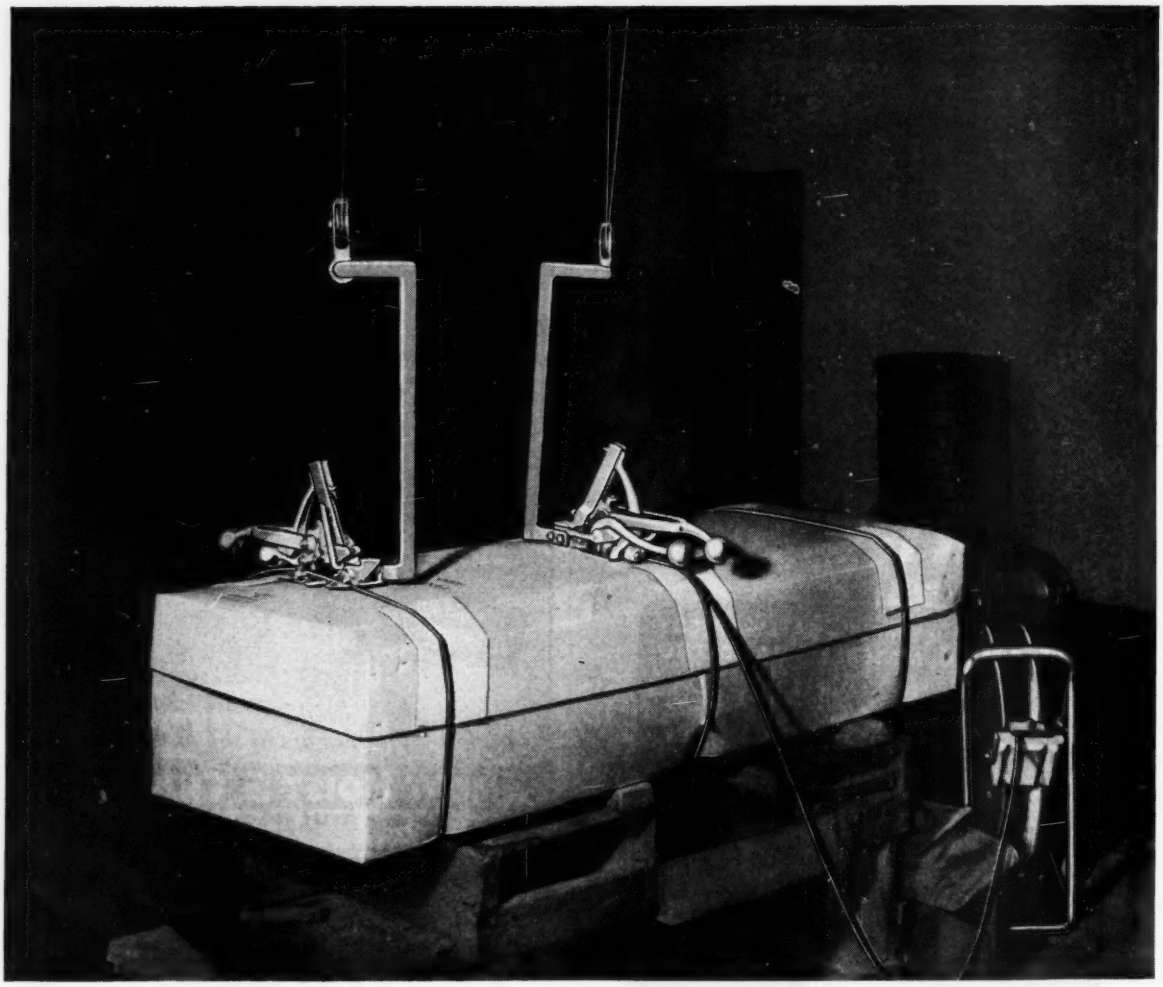

Stanley Steel Strapping Solves Tough Packaging Problem

The Hettrick Mfg. Co.'s Goshen, Indiana plant had a problem packing their porch and lawn furniture. Stanley recommended the speedy Ace Strapping Tool—with this overhead installation to make tool readily available at strapping point.

This way Hettrick saves time and labor—gets a stronger, better, safer package. See how the Stanley Steel Strapping System can cut your shipping costs. The Stanley Works, Steel Strapping Division, 203 Lake Street, New Britain, Connecticut.

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STEEL STRAPPING AND CAR BANDING SYSTEMS

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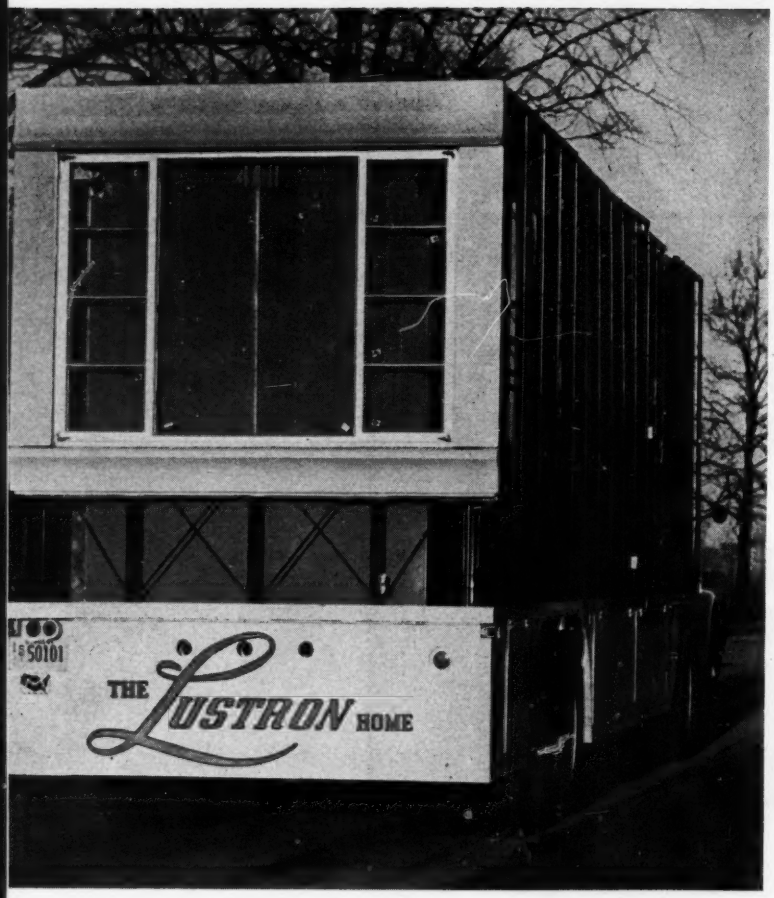
PACKAGING MECHANICS SECTION

A regular monthly section in which are presented solutions to the problems of efficient filling and handling the boxes, cartons, bags, bottles, cases, etc., used in commerce and industry.

CONTENTS

WRAP UP A HOUSE—in one package. At the Lustron Corp. an entire five-room house is packed and loaded at a total cost of $100. 30 manhours and $42.11 of packaging materials are required for America's biggest line produced package. Note the planning devoted to pre-packaging in this operation..... 62

A 48 PER CENT DECREASE IN COST—in spite of an increase of 25 per cent in hourly wages. Automatic machinery is part of the story, but layout and engineered handling play major roles. 85 workers have a combined output of approximately 24,000 quart bottles of pickles per eight-hour day..... 68



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The complete "package" rolling on the highway . . . components for an entire 5-room house.

WRAP UP A HOUSE . . . In One Package

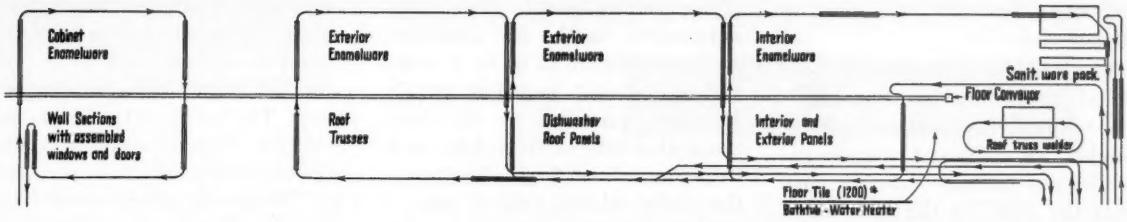
An entire 5-room porcelain enamel home is packed and loaded at a total cost of $100—30 manhours and $42.11 worth of packing materials. While America's biggest line-produced package is a dramatic innovation, it uses tried and tested procedures and materials for a low-cost operation.

THE observer at the Lustron Corporation plant usually draws on his imagination in following through the conversion of raw steel into components for a complete five-room house. It is unusual to see metal piece parts ending up—not as an automobile or a refrigerator or heater—but as a livable home. The observer must similarly fall back on his imagination when he views for the first time the loading of all the components for an entire home on one highway trailer. *(The production flow through the Lustron plant is described in a separate article in this issue.—Ed.)*

Highway Trailers Are Assembly Dollies for Biggest U. S. Package

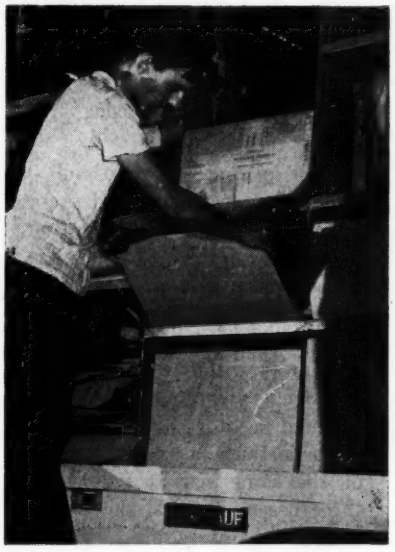
The five-room Lustron home is possibly the biggest U. S. package produced on an assembly line basis. The thousands of parts total to a weight that is close to 25,000 lb. Included in this weight are such small hardware items as bolts, nuts and screws. On the other end of the scale are 16 ft. long roof trusses weighing 150 lb. each, and gable end trusses with a weight close to 400 lb. per unit. In between these extremes are hundreds of porcelain enamel architectural panels, boxes of asphalt tiles, a water heat-

By EDMUND LAUE
Packaging Engineer
The Lustron Corporation, Columbus, Ohio



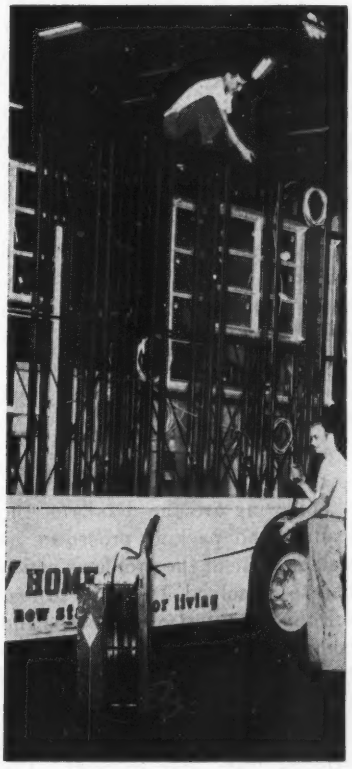
FLOW SHEET includes delivering conveyors and shows locations of major component parts. ▲

SCALE MODEL of 800 ft. load line incorporates proposed plan for conveyor storage sections. Packing stations are on both sides of floor chain which propels 32 ft. highway trailers. ▶

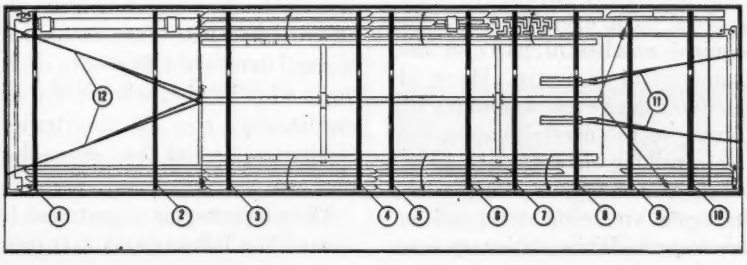


◀ **CLOSEUP** of trailer compartments at one of 32 stations. Corrugated fiberboard closes compartment openings.

WALL SECTIONS on sills are steel strapped, make effective retainers for compartments. ▶



▼ **STRAPPING PATTERN** is shown in this sketch. Close to 200 ft. of strapping are used per trailer.



ing unit, bathtub and—yes, a kitchen sink.

The problem of combining these varied items into one "package" was originally approached from a number of different directions. While "one package" was our goal from the start, in the early days of the Lustron home production planning (around January of 1948) we tried boxing the individual groups of items for shipment by rail car. The result was 201 engineered packages taking up 5,300 cubic feet, their weight controlled so that the heaviest ones could be lifted by two men. While such shipments arrived satisfactorily, including the porcelain enamel components, work continued on our long-range plan of loading an entire house on one trailer which would be specially equipped for the purpose. Our mockup was finally turned over to a trailer manufacturer, who refined the details. The result is shown on these pages.

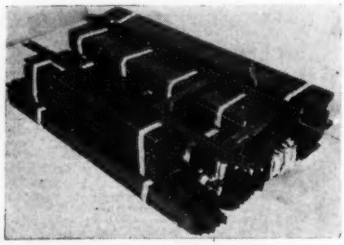
The parts are loaded on the trailer as it is propelled down the length of the load line by a floor chain. The vehicles are spaced 10 to 12 ft. apart. Each type of component and equipment is loaded in a predetermined compartment or section. This makes each trailer an "order assembly dolly", with the exception that the same vehicle also transports the house to the erection site and serves as "warehouse" during the construction period. As one loaded trailer is hauled away from the end point, an empty unit is added to the start of the line.

Dual Loading Station Layout

Following are the details of the loading and packing procedure as well as some of the problems which had to be solved. It stands to reason that a project of this scope and complexity would pose problems the solutions to which must be tested over a period of time.

The load line is 800 ft. long and extends from east to west. The closed circuits of five transport conveyors circle as many sections of the loading area to deliver the components to the bin locations.

The trailers are 32′ 9″ by 8′ wide, and their height loaded is 12′ 3″. They are propelled by the floor chain at a rate of from 3 ft. to 4 ft. per minute. A fork is hooked to the dolly wheels (which ride a steel track) and attached to the drag chain. Each trailer has 77 compartments, plus a T-rack for structural members, and a sill extending the full length of the vehicle on each side.



IMPORTANCE OF PREPACKAGING. 237 plenum parts are reduced to 9 bundles, using industrial tape.

There are 32 loading stations along the 800 ft. line—16 on each side. These are at various elevations, which correspond to the different levels of the compartments on the trailers. In this way lifting effort on the part of the operators is minimized. In other words, the operators are at the same level as the compartments which they are loading. This is important in view of the 12′ 3″ loaded height of the trailer.

The schematic layout sketch on these pages shows the bin arrangement for the main types of components, as well as the loops of the five transport conveyors, in relation to the central drag chain. Progressive assembly line methods can be adapted as readily to the packaging of an entire house as well as to a jar of cosmetics weighing a few ounces.

As the trailers advance past the stations, each operator loads the required number of parts in the compartment indicated. Many of the items can be reached simply by turning to the nearby bins at one side. Walking, like heavy lifting, is held to a minimum. Further refinements are being developed in this respect. While stationary bins are used to a large extent at present, it is planned to install gravity conveyor sections, wherever possible, for storage and feeding purposes. The length of the individual conveyor sections would give the necessary temporary storage capacity. Moreover, rollers would facilitate the delivery of certain items to the trailer compartments.

So far, a few gravity roller lanes are used for feeding certain types of utility units to the trailers. Upon completion of the necessary packing, these bulky units are shunted to the proper compartment as the vehicle travels slowly past the station.

It should be pointed out that the loading is done in reverse order—that is, the items needed first at the erection site can be taken off in the desired sequence. The foundation package, incidentally, is the only item not included on the trailer. It is shipped ahead so that the foundation will be ready when the house arrives.

Planned Prepackaging Facilitates the Job

The loading of thousands of small hardware items and pressed metal piece parts involves a prepackaging problem of no small proportions. For example, 4,000 hardware items are delivered in three containers to the load line. The units within each carton are packaged according to each individual need or part of the house. If, for instance, a total of 80 screws of the same size is required for three assembly jobs, they will be bagged separately and marked accordingly. If this breakdown seems too fine, the end result justifies it. 1. Prepackaged units avoid delay at the load line. 2. Prepackaging at the plant saves erection time in the field. 3. Confusion through errors is avoided. Thus thousands of small items are delivered to loading in a few handy packages. These, incidentally, also fit the trailer compartments and thus save shipping space.

The prepackaging department is located in a balcony area that par-

allels the load line. A separate station is maintained for each type of part—cabinets and electrical, for example—and the full cartons are delivered to the ground floor level by a transport conveyor which travels past this area.

Certain interior components are unitized. An example are plenum parts, which total to 235 pressed metal pieces for each Lustron home. These were reduced to nine bundles by the use of pressure sensitive industrial tape, as shown in one of the photos. (The plenum referred to is the heating chamber above the ceiling for a radiant heat unit.) It is readily understood that nine bundles are much more easily checked and loaded than 235 individual piece parts. This method also reduces shortages reported from the field.

Our department attempts to control specifications for the packaging of purchased parts. Dimensions of containers must be followed rigidly by vendors, otherwise the crate for a water heater, for example, might not fit into the trailer compartment allotted to it. We also specify packing requirements in excess of those commonly used for certain products. The reason is that the better container will withstand extra warehousing as well as reshipping.

The problem of chipping in relation to enameled ware needs no explanation. Chipping must be prevented as the items travel through the plant, in loading on the trailers, and during transportation to the site. While we control this problem within the plant, constant efforts are made to educate the workers in the field.

Packing Materials Neat Loading Procedures

The 77 bin compartments on the trailers are actually sheet metal boxes with this difference: they are loaded from the side instead of from the top and are permanently at-

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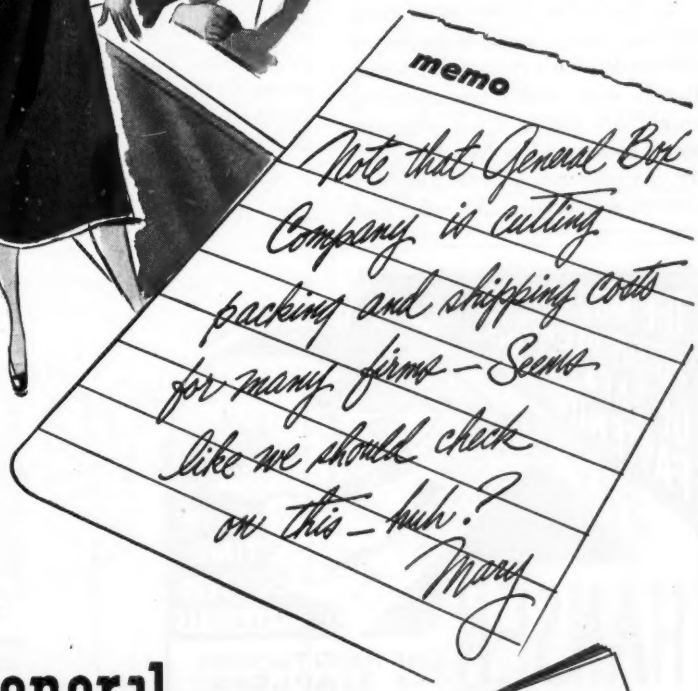
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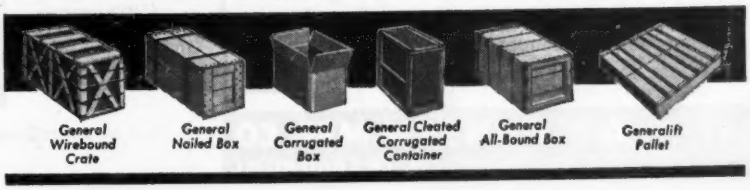

tached to the vehicle as part of its superstructure. The inner packing or cushioning material used is much the same as that employed for packing boxes. These materials include corrugated fiber and chip board; cellulose wadding (on cabinets for protecting the finish from steel strapping which secures the drawers for shipment); crepe kraft paper, and large sheets of waterproof paper. The latter is placed over the top and sides as protection against dust and moisture. Corrugated fibreboard encloses the open compartment sides upon completion of loading.

As the trailer is advanced down the line, the bin compartments are first loaded with the smaller items. Panels with highly concentrated weight are put in lower compartments to keep a low center of gravity. To maintain an even distribution of weight per axle, the road side of the vehicle is loaded about 300 lb. heavier, which compensates for the crown of the road.

Reference to the layout shows that such heavy and bulky parts as roof trusses and wall sections are loaded near the end of the line. Roof trusses are hung on a T-structure in the center of the trailer. Last come the 8′ x 8′ 3″ x 4″ wall sections (they are the first items needed in erection). These are placed on the sills, and are wired in with soft wire until the steel strapping is applied. The wall sections strapped to both sides of the vehicle serve, in effect, as retaining walls for the material in the open-sided compartments in the center of the trailer. When the large sections have been secured with steel strapping, it would be impossible for any small item to be jarred out of position. The erected house encloses 12,000 cu. ft., and packaged on the trailer it takes up 2,400 cu. feet of space.

A diagramatic sketch illustrates the application pattern of ¾″ steel strapping. Ten lengths are passed over the eight ft. width of the load. To retain the two end sections, two straps are tied at each end to the truss compartments, as shown. The complete job requires 196 ft. of steel strapping for secure shipping.

"Send Me a Beige House"

At the end of the load line the fork is automatically disengaged from the floor chain, whereupon a tractor hauls the completed unit to the yard, awaiting scheduled delivery to the site. Shipments by this method arrive in satisfactory condition even to fairly distant parts of the country. Tractors start and stop slowly, and travel over a predetermined route.

As I observed earlier, the proposed solutions to some of the problems are being subjected to study and tests. Some are strictly traffic problems, deadheading mileage being one of them. One approach taken to reducing transportation cost would be to ship the

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completely loaded trailers on railroad flatcars. This involves three problems. 1. The rate for the house as well as the return freight on the empty trailer. 2. Will the trailer with contents be shippable? 3. A study of railroad clearances will have to be made. So far, several railroads have indicated an interest in this project, which also involves a number of technical considerations. If this method should be feasible, then the contractor at the receiving point will pick up the trailer with his tractor or a hired one.

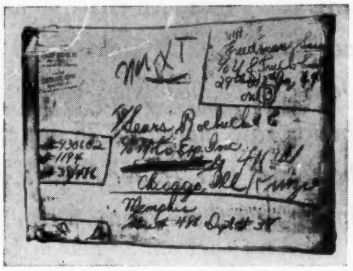
Another question that remains to be settled concerns the shipping of replacement parts to dealers, which is also being studied.

However, the main challenge—that of shipping a complete home in one package—has been met The customer can order from his local contractor a five-room home in one of five colors, and receive it in one shipment. You now have an idea of what is involved in assembling America's biggest line-produced package.

Poor Marking Costs $10,000,000

THE AMERICAN TRUCKING ASSOCIATION, INC., estimates that its loss and damage bill for 1948 was $30,000,000. Of this amount $10,000,000 is thought to have been paid for shortage claims of entire packages, resulting primarily from faulty marking or no marking at all. Much of this sheer waste could be prevented, suggests the association, if all shippers used correct marking methods.

A proportion of these losses is attributed to concerns which have become shippers in recent times and which are not entirely aware of the requirements of good marking. Others believe they can save money by trying to do it in the cheapest way. That's false economy. Regardless of whether



THE POOR EXAMPLE of addressing, top, is confusing, leads to losses and high insurance rates. CLEAR STENCILED addressing, right, delivers the shipment, avoids delay and losses

the carrier or an insurance company pays for the claim, in the final analysis the shipper bears the burden through increased rates.

In the "poor marking" category are: illegibly written tags that are easily torn off, carelessly attached stickers that rub off and poor handwriting in crayon that becomes obliterated through friction with other packages.

The answer is marking of addresses on shipments that is plain, legible and durable, according to the association's freight claim council. Stencil marking has long been recommended for this reason. A weatherproof, smearproof ink will not rub off, and stencils can be cut quickly on modern stencil machines. Free-hand lettering seldom compares with the legibility of the stencil.

It is recommended that the address be stenciled in two places, preferably on the top and one side of each carton, and that extraneous advertising markings be avoided.

The address that STAYS delivers the shipment to destination.

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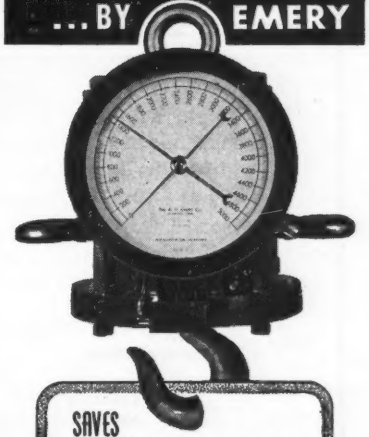

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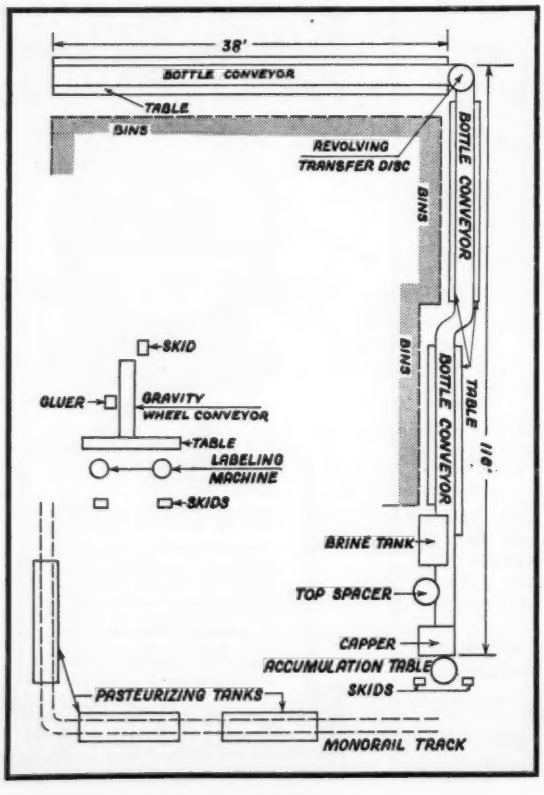
PACKAGING MECHANICS SECTION

GIRLS FEED BOTTLES to capping machines. At right, loaded skid is trucked to shipping.

Flow Methods For Pickles

The adoption of flow methods in conjunction with automatic machinery has netted a cost reduction of 48 per cent per dozen jars of pickles. At the same time the labor force has been more than tripled and the hourly rate increased 25 per cent. This has been the record of I. Miller Pickles, Inc. within the past three years.



INSTALLATION OF LINES along the walls leaves center of room free for storage and incidental processing.

ONLY 24 hours elapse between receiving and bottling at I. Miller Pickles, Inc., North Tonawanda, N.Y. As with all perishable foodstuffs, speed is essential to prevent spoilage. Equipment was installed and the layout designed to meet this need.

The company bottles 30 kinds of pickles in bottles ranging from eight ozs. to one gallon. Dill pickles in quart jars are representative of the handling throughout, and form the subject of this article.

Flow Through Rectangular Layout

The bottling room is 50′ x 120′, with two of its sides taken up by

raw pickle bins. These bins are paralleled by a five-in.-wide table top conveyor, as shown in the flow sheet. A revolving disc transfers the bottles from one section to the next. Guide rails, located the length of the 154-ft. conveyor sections are adjustable to bottles of different sizes.

Three pasteurizing tanks are located at the southeast corner of the room. Adjacent to the last tank are the labeling and packing stations. A monorail track runs from the end of the conveyor line around to the labeling machines. Thus, the flow is around the sides of the room, with the center of the rectangular space being used for certain production functions and in-process storage.

The raw, washed pickles are trucked from the receiving area to the bottling room. If they are to be cut, they are fed through

CHAIN BELT CONVEYOR carries filled jars to capping. Other bottles are placed on table.

machines (some are hand cut), then placed in one of the bins behind the conveyor. If no cutting is necessary, they are sent directly to the bins.

One operator is stationed on each side of the 23 bins, two working as a team and placing the product into bottles. (According to the company, no automatic bottling machinery for pickles is available.) An experienced operator can pack from 60-80 jars per hour.

The bottles are brought to the stations in reshippable cartons. The empties are placed on tables which flank the bottle conveyor. An operator notes the number which each girl receives and places the empty cartons on a skid. (The total of bottles delivered to each girl daily determines her output on a piece-work schedule.) The skidded cartons are periodically hand-trucked to the packing stations.

Intermittent Capping and Conveyor Operation

A rather interesting aspect of the operations is that the bottle conveyor is run only at intervals of about every 10 minutes. The automatic capping machine at the end of the line has a large enough capacity to absorb the output that is accumulated from all hand bottling stations during these intervals. The operators place the filled jars on the stationary belt, or on the tables when the line is filled.

Another useful purpose is served by the intermittent operation. During its period of idleness, an inspector passes down the line and checks each bottle for content and appearance. Also, if the belt were run continuously, the operator at the take-away point would be idle part of the time waiting for enough bottles to accumulate. When the belt does not run, this operator is dispatched to such other duties as transferring loads to the next station (pasteurizing). These additional tasks require about the same time as the intervals between the capping operations, so that no productive time is lost. One operator takes care of both jobs without difficulty. In other words, all operators connected with this phase of the processing are working steadily, which would not be true if the belt ran continuously.

Table Top Conveyor with Drains

The filled bottles continue to the brine tank which is approximately 135 ft. from the beginning of the conveyor line. Brine is automatically sprayed into the open bottles from above, and spilled brine is drawn off through four holes in each slat of the bottle conveyor. From the pan below, it is pumped away and filtered for reuse. A drain pan is located under the conveyor to receive any additional liquid from the bottles or conveyor.

The traveling jars are next engaged by an 18-in.-long section of screw conveyor mounted at one side of the belt. The threads space the containers into a head-spacer machine where three rubber plungers push out enough brine to allow for the condensation of steam

ONE-TON HOIST lowers jars into pasteurizing tank. Lifting frame fits posts on retort.

in the succeeding vacuum capping operation. The extra brine is received in a pan and pumped away for re-use.

The automatic vapor vacuum pack machine has capacity of 300 bottles per minute (it is normally run at a slower speed.) As the bottles feed into the equipment, steam is forced into them and the cap pressed on (vacuum is achieved by placing the cap less than one second after the steam is introduced). Caps in the machine's hopper are tumbled to drop into a chute. The bottles than feed to the accumulation table located at the end of the conveyor line (see flow sheet).

Specially Designed Retorts, Lifting Frame

An operator standing behind this table places a belt around six bottles and with one motion passes them from the table into a retort. The retorts are 3½′ x 5′ and are equipped with 3″ x 3′ uprights at each corner. When the retort is filled, three additional trays are placed on top within the extensions. Each tray and the retort hold approximately 150 one-quart jars; the total capacity is there-

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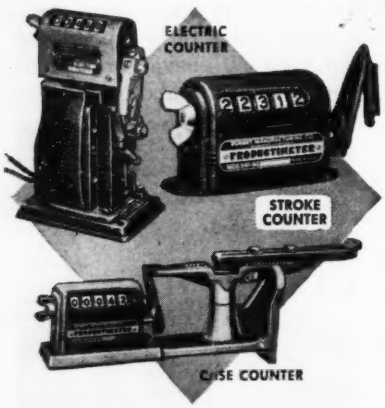

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fore 52 dozens. The trays and retort are constructed of wire mesh or perforated sheet metal to allow circulation of the water used in the next operation.

The filled unit is picked up by a one-ton hoist mounted on a monorail and moved to one of the six pasteurizing tanks. A square lifting frame designed for the retort is lowered over the vertical extensions. Holes in the vertical members on the ends of the frame are lined up with the holes in the extensions and pipes inserted to secure the two for lifting, whereupon the hoist is pushed to one of the tanks. The bottles are then lowered into position and the frame is unhooked.

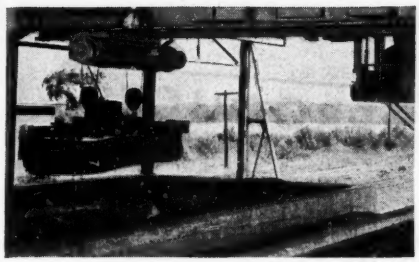
The pickles remain in the tank approximately 75 minutes for pasteurizing and cooling. The load of finished pickles is hoisted by the lifting frame and moved to skids located adjacent to two labeling machines.

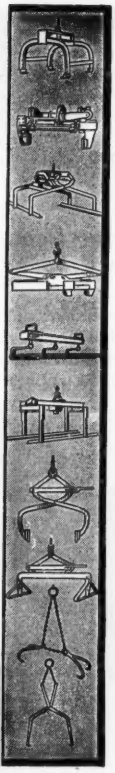
Each of these two semi-automatic machines has a capacity of 80 jars per minute. One girl at each retort deposits the jars on a 3' x 3' table adjacent to the labeler. The jars are placed into and removed manually from the machine, then transferred to two girls who pack 12 (quarts) into corrugated cases.

Production Up, Costs Down

Certain refinements in the overall operations are now in the planning stage. The company has added equipment and improved methods consistently since it began business just three years ago. This program of improvements has paid off through consistent cost reductions.

Little more than 36 months ago, 25 operators had a combined output of about 350 cases per 8-hour day (all operations were performed manually). It is estimated that the production cost at that time was approximately 75 cents per dozen jars. Today, 85 workers, in conjunction with the equipment and methods described, have a combined output of approximately 2000 cases, or 24,000 quart bottles per eight-hour day, at a cost of 36 cents a dozen.





VENEER PLANTS

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Soaking-pit operations, normally requiring 3 or 4 men, are performed entirely by one crane operator, with no floor assistance. Mansaver Grab will handle all variations of log sizes from crane cab. Safety increased because no man need be near the hot solutions.

Write for complete details on this safe, labor saving equipment.

COMPLETE YOUR CRANES WITH

MANSAVER GRABS

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CESCO DUMPER HANDLES BAGS, DRUMS AND BULK

MULTI-PURPOSE DUMPERS for dumping bags, bulk or drums, as well as single-purpose types save handling time and reduce accidents. Dumping heights range from 5 to 12 ft. Special sizes made on order. Have lifting capacity of 500 lbs.; handle up to 100 loads per hr. ½ H.P. motor controlled by push button. Immediate delivery. Write for 8-page catalog.

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COLSON EQUIPMENT & SUPPLY CO.

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150% more work per man hour with FLOOR-VEYOR*

It's true! Your employees do 2 to 3 times the work per man hour with a Rapistan* interfloor power belt conveyor! Here's a typical example: At the DeVoe & Reynolds Co., Inc., Atlanta, Ga., a 5-man crew formerly moved materials into storage at the rate of 900 lbs. per man hour. With Floor-Veyor, the same crew now moves 2,253 lbs. per man hour — a 150% increase in work per man hour!

And Floor-Veyor is just one of the many Rapistan Material Flow gravity and power conveyors designed to cut your handling costs! You choose whatever you need: SINGLE SECTIONS of aluminum or steel gravity conveyor in 5' or 10' lengths, 45° and 90° curves . . . POWER BELTS for horizontal, inclined or between-floors operation . . . a COMPLETE SYSTEM of gravity and power conveyors for cost-cutting material *flow!*

SEND FOR YOUR FREE COPY of RAPISTAN MATERIAL FLOW AT WORK!

See how carloading was cut from 80 to 8 man hours . . . how a processor saved $200 a week . . . how unloading costs were cut from $17.10 to $1.90 per car . . . and how Rapistan equipment can work for YOU!

*T.M.

Representatives in all Principal Cities

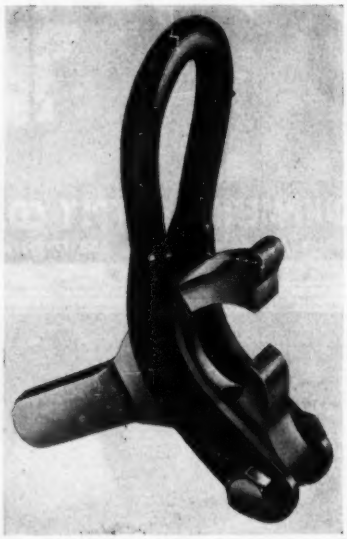
THE RAPIDS-STANDARD COMPANY, INC., 41 Rapistan Building, Grand Rapids 2, Mich.

NEW PRODUCTS

For additional information on these products, write Dept. 5, Flow Magazine, 1240 Ontario St., Cleveland 13, or use postcard bound into this issue.

DRUM TILTER

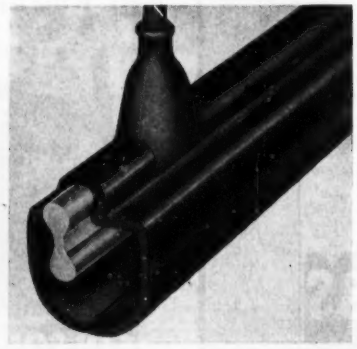
NP1—Merrill Brothers is manufacturing a Drum Tilter, a tool used in combination with a ½-ton clamp, and designed for repetitive drum dumping operations. The tilter is connected to the end of a fixed suspended chain. When the drum is raised by a hoist, the tilter is hooked to the bottom of the



container, which is then lowered. The bottom is thus held in one position while the drum is emptying. The tilter automatically releases when the container is hoisted to an up-right position. The unit weighs four lb. and has a rated capacity of one ton and a safety factor of five to one.

SAFETY ENCLOSURE FOR OPEN CONDUCTOR BARS

NP2—Protection from open conductor bars on monorails and cranes is available with Con-L-Duit, a safety enclosure made of a specially compounded neoprene-base rubber and manufactured by Calabar Corp. The unit is designed for straight runs, curves, switches, interlocks and drop sections. It is made in two sizes to fit any new or existing figure-eight conductor bar system of 100, 200 or 400 Amp. capacities. A slide type shoe collector operates wholly within the Con-L-Duit enclosure under light spring pressure. The shoe is mounted on an elongated oval stud which extends downward through a continuous slit. It parts the rubber as the



shoe collector travels in either direction and by this action is said to increase the life and maintain the resiliency of the rubber enclosure. The enclosure is claimed to be unaffected by severe weather or fume conditions and to prevent icing of conductor bars.

LOAD-GRAB ARMS

NP3—Carton-handling Load-Grab arms, previously available only for the Hyster Co.'s 2000-lb. capacity lift truck, have been announced for the 4000-lb. or "40" lift truck. This carton-handling attachment for the larger capacity truck

is designed for handling merchandise packaged in paperboard containers. It is especially recommended for food processing plants, canneries, wholesale grocery firms, variety, drug and department store warehouses, and factories which package goods in cartons. Loads up to 2310 lb. rated at 24-in. load centers may be effectively handled by the device, it is said. Two steel plates, each 25" wide, 34½" high and ⅜" thick are mounted on each side of the attachment. These surfaces, abrasive-faced for non-slip retention, squeeze the load with just enough pressure to lift securely.

RIDING TYPE STACKER

NP4—This Transrider Stacker, developed by The Automatic Transportation Co., is said to be the first riding type

stacker ever designed. The new model was developed to bridge the gap between motorized hand truck and fork truck operations. It is claimed to be equal in performance to any fork truck of the same capacity.

MOBILE HYDRAULIC LIFT

NP5—The "Mobil-Draulic" Lift, manufactured by the Lange Co., offers a combination hydraulic elevator and hand-operated four-wheel truck. The

unit is designed to reduce material handling time by placing metal sheets, bars, pipes, rods and structural shapes immediately adjacent to fabricating machines. Power to elevate the load is obtained with a hand operated hydrau-

lic pump. Reciprocation of the pump handle forces hydraulic fluid into a long stroke, heavy-duty cylinder. On the ram end of this cylinder are two steel rolls. These push against two semi-circular cams welded to the forward upright or riser of the lift. A heavy tie-bar connects this upright with the rear riser, synchronizing the elevating movement of both. A motorized or gasoline-driven pump is available. When the hand pump is used, the load may be raised to full height in 80 seconds. A feature of the lifting arrangement is the camming action obtained—in effect the load is actually rolled upward.

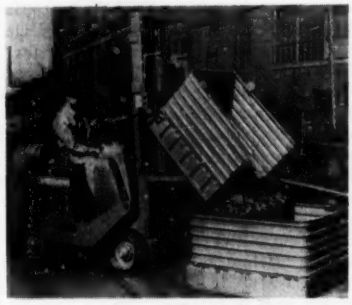
TRANSPARENT PLASTIC TRAYS

NP6—Designed to store and identify small parts in a clean and orderly manner are these combination metal shelf racks and plastic trays. Manufactured by Andrew Technical Service, the units come in two sizes. A complete unit consists of a steel shelf section 34½" wide,

14¾" high, 11⅝" deep, equipped with as many as 56 plastic trays. Each tray has four removable partitions, two providing five flexible compartments. Typical items stored are small tools, screws, bolts, nuts, electronic parts, name plates, washers and instrument parts. Individual shelf sections can be stacked atop one another to any desirable height, and are designed to fit into standard metal shelving. Two different sizes of trays measure 11⅜" x 2" x 2¾" and 11⅜" x 3¾" x 2¾", respectively. Trays have an index card slot and molded-in finger pull at the front. Blank indexing cards are included. These can also be slipped in behind each partition for positive identification of contents.

SKIP BOX DUMPING DEVICE

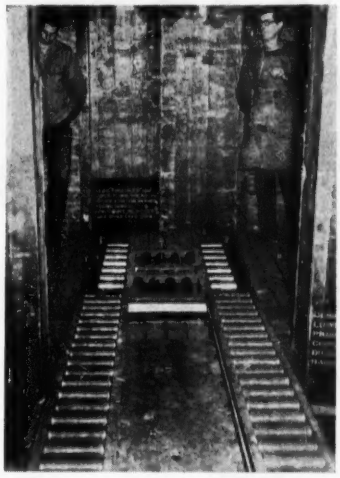
NP7—The Towmotor Corp. has developed a Skip Box Dumping Device for use with lift trucks in plants where large quantities of heavy, loose parts



must be constantly lifted, moved, stored or delivered to production lines. A special hydraulic dumping device has been designed to tilt the box while it is held in an elevated position. The three-sided box is fitted with metal rings at the back—special hooks on the lift truck carriage engage these rings when the box is lifted by the forks. To dump, the truck operator actuates a double-acting hydraulic cylinder which raises the hooks, tilting the box forward and allowing the load to flow out through its open front into a container. Loads up to 4000 lb. can be handled with the new device.

ROLLER TOP DOLLIES

NP8—Island Equipment Corp. has added a new item to its line of material handling equipment. Known as ULTI-MATE Roller Top Dollies, this equipment is designed for use in connection



with palletized loads for loading and unloading cases, cartons, etc. into and out of rail cars or in warehouses. Specifications for the unit are as follows: length, 40½ in.; width, 37 in.; frame, 2 x 2 x ¼ in. angle; roller centers, four in.—bottom rollers staggered; bottom rollers, 2½ x 14 ga. x 12 in.; top rollers, 2½ x 14 ga. x 8 in. Other sizes are available.

HAND TRUCK CARRIER

NP9—A carrier for two-wheel bottled beverage carts, that attaches easily to any type of truck body, is now available from Skarnes Engineering & Supply Inc. The Kart-Karrier is designed to prevent loss or damage of hand trucks on the road, and keep carts within easy reach of the driver. The unit locks the cart securely against the truck body by means of a strong steel clip, which must be released before the cart can be removed. The forks or nose of the cart are placed securely beneath the bumper or body of the truck to prevent swinging. Two bolts hold the clamp rigid to the truck body. Developed for beverage concerns, including breweries, soft-drink bottlers and dairies, the unit also has application

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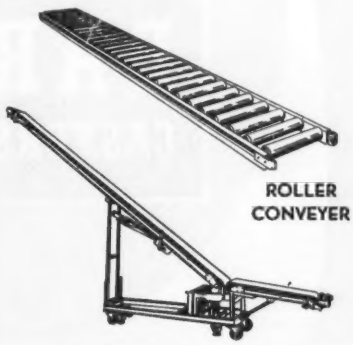
PORTABLE WHEEL and ROLLER CONVEYERS, LEVEL, INTER-FLOOR and PORTABLE BELT CONVEYERS

WHEEL CONVEYER



ROLLER CONVEYER

WESTERN TYPE PORTABLE BELT CONVEYER

EASTERN TYPE PORTABLE BELT CONVEYER

If you're not using Mathews Conveyers to move your materials, it could be costing you money!

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for wholesale grocers, chain stores, motor transport companies, railroads, and others.

HAND STAMP STENCIL

NP10—The Multistamp Co., manufacturers of Hand Stamp Stencil Duplicator Outfits, has added the No. 1 Special Oversize Duplicator Outfit to its regular line. The unit is similar to the Standard No. 1 except that it has a larger ink pad and larger stencils. Designed primarily to meet certain requirements for an "in-between" size, slightly larger than the Standard No. 1 and smaller than the Standard No. 3, the new model has a printing area 3¼" long x 1⅜" deep. The unit is designed primarily for addressing shipping tags, labels, signatures, code-markings, and printing on post cards, cartons, boxes, packages, office forms, bulletins or on objects of unlimited size.

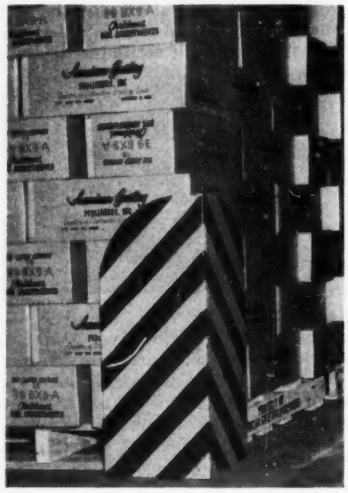
CIRCLE NUMBERS ON THE CARD AND MAIL!

FLOOR SURFACING MATERIAL

NP11—One minute after application of Swift Floor, a new plastic-type floor material offered by The Monroe Co., you can truck a 50,000 pound load over it, according to the manufacturer. It is further claimed that the product can be used either for patching wood or concrete floors, or for complete resurfacing of aisleways, loading platforms, ramps, driveways, etc. One man can install the material with either the tamper (which is supplied with the initial order for one drum) or by rolling. Since it is set by compression, rather than by water evaporation, the more traffic that flows over it, and the heavier the load, the smoother and harder the floor becomes. The material is packed in 55-gallon lever-top drums, ready to use.

METAL CORNER PROTECTOR

NP12—The Economy Equipment Co. is offering a Metal Corner Protector designed for use at aisle corners to prevent damage to materials and as a guide for truck operators. Improved housekeeping is also claimed as a feature because of the resultant neat and orderly appearance of the storage area. The protectors are constructed of heavy-gauge steel, and are 30" high with 12"-wide sides. A square metal base permits the load to overhang the pallet, skid, etc., while still holding the corner firm. Approximate weight of the units is 25 lb. They have a baked enamel finish with orange and black stripes for visibility.



PORTABLE ELEVATOR

NP13—Lewis-Shepard Products, Inc., has announced a new addition to its line of "Master" Stackers, portable elevators. Known as the "Handy Hoister," the unit has a 1000-lb. capacity, arc-welded construction, is comparatively light in weight and can be readily moved by means of push handles. All wheels are equipped with roller bearings and caster steer for maximum maneuverability in confined areas. The standard model has a lifting platform 24" x 30", a lowered height of 50½" and a lifting height of 58" over-all height is 76". The hoisting mechanism raises and lowers the lifting carriage 1½" with each revolution of the crank. Double pad spring-loaded floor locks

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CASTERS & WHEELS

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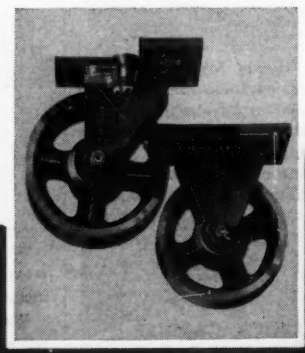

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- Will increase efficiency of employees
- Made in any size for any type of use

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A rubber-tire mobile Lorain Moto-Crane really flies around at the Grumman Aircraft Engineering Co. plant at Bethpage, L. I. . . . doing a wide variety of material handling jobs, including handling finished products.

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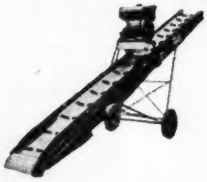
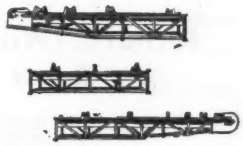
CAR UNLOADERS for unloading hopper bottom cars. Models 483-484. Belt or Drag.



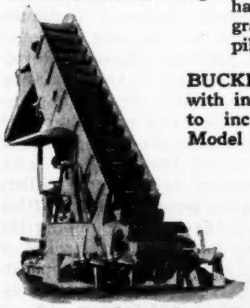
FLAT or TROUGH BELT CONVEYORS for handling coal, coke, sand, gravel, etc. to trucks or piles. Models 481 & 482.

DRAG CONVEYORS for handling all sizes of coal and coke. Model 486.

PACKAGE CONVEYORS for handling bags, boxes, crates, cartons, hampers, etc. Model 485.

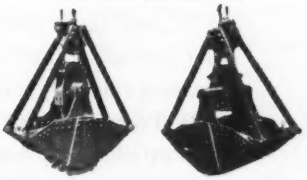


SECTIONAL CONVEYORS made in easily assembled individual sections. Portable or stationary for handling all bulk materials. Model 487.



BUCKET LOADERS, heavy duty with integral swivel belt conveyor to increase zone of discharge. Model SBC.

BUCKET LOADERS for excavating, rehandling, stripping and loading sand, gravel, stone, topsoil, coal, etc. Capacity 3 to 8 yds. per minute. Models 75, 77, 80, 135.



Heavy Duty or Light Duty Clamshell Buckets for high speed excavating or rehandling.

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operated by a single handle hold the unit in position while loads are being transferred to or from the lifting platform.

BIN UNITS

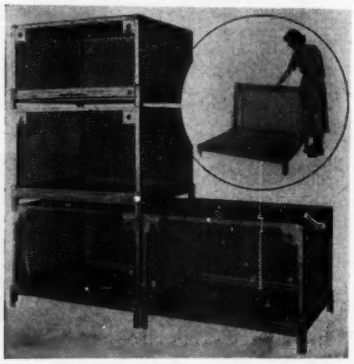
NP14—Lyon Metal Products, Inc., has announced a new line of 78-in. bin units. These units are designed for flat storage, tool storage, box and small parts storage and display of parts or small bulk or packaged items. They are three ft. wide, one ft. deep and 6½ ft. high. Dividers in all bins are adjustable horizontally every inch by the use of Lyon "Snap-Ins"; no nuts, bolts or tools are required. Shelves are adjustable up and down every 1½ in. where dividers are not used. Shelves are reversible to provide flat or bin type storage. Eight different units are available together with a variety of accessories, including shelf boxes and sloping bins and dividers.

LOAD BINDER

NP15—American Forge & Mfg. Co. has developed a new ratchet-type load binder for securing heavy industrial loads on trucks and trailers. A recent feature is a compact ratchet weighing only 13 lb. with a barrel length of 10 ins. According to the manufacturer, this load binder provides a maximum amount of safety for the operator. There is no eccentric to trip, thus alleviating kickbacks and exerting thrusts. The unit has an eight-in. take-up allowing the load to be retightened at any time en route without having to release the tension or readjust the chain. The load binder is of all-steel construction, with screw threads, forge-welded links and a double-acting spring-loaded pawl. It is said that 8500 lb. tension can be brought up by one man with the integral lever.

STORAGE AND SHIPPING CONTAINER

NP16—Designed for handling, storing and shipping of materials is the new PACO Trans-A-Box available from Production Accessories Co. By releasing two locking pins, the unit is ready to fold quickly and easily to 25 percent of its original bulk. The container is



built of heavy-gauge expanded metal, supported by a rugged steel framework. It requires no liners and is arc welded throughout for extra strength. Unobstructed four-in. entry all around the base is designed for quick handling.

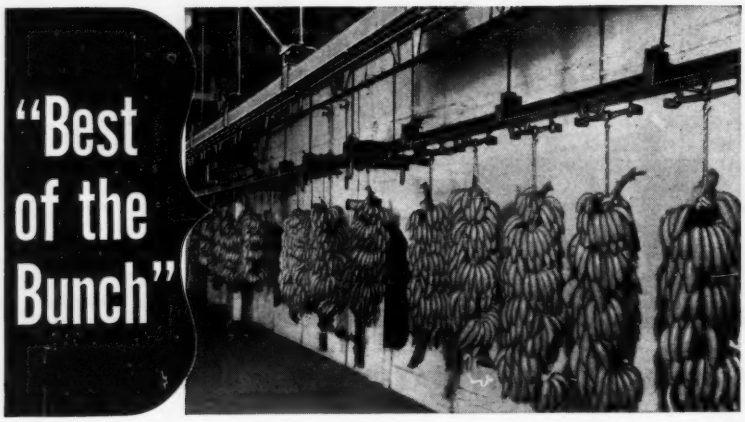
CIRCLE NUMBERS ON THE CARD AND MAIL!

HYDRAULIC HAND PALLETRUCK

NP17—A newly designed hydraulic hand lift truck for use with single or double faced pallets is offered by Revolvator Co. This truck is an adaptation of two earlier models. By a slide plane arrangement the forks are raised and lowered, permitting the dual wheels in each fork to roll smoothly over sills, cross members of double faced pallets and up ramps. Operation of the lifting mechanism is effected by pumping the handle, using long or short strokes as preferred. The oversize lift ram, operating vertically, raises the load four ins. The handle rotates 360 degrees and will lift in any position. Lowering is by foot lever, at any speed desired, and fall is cushioned to prevent noise and jar.

UPENDER DEVICE

NP18—An upending device for fork trucks designed to turn a roll of paper or other heavy cylindrical item 90 degrees from horizontal position to verti-



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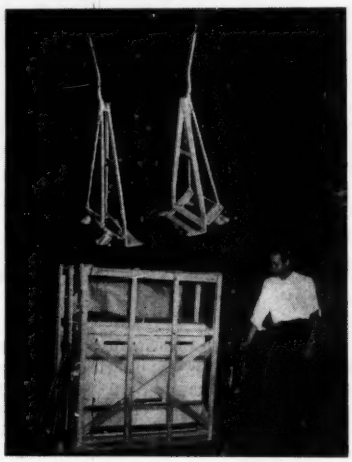
AURORA, ILLINOIS, U.S.A.

cal or vice versa, has been developed by Clark Equipment Co. The load is grasped around its circumference by a set of fork arms, actuated by a hydraulically-operated clamping cylinder. Sufficient squeezing pressure holds an average load securely by friction, without employment of ribs, lugs or brackets. Special rubber-covered arms can be provided for handling items that require protection. Maximum width of the device is 35 ins.; and standard arms will handle items of diameters from a minimum of 15 ins. to a maximum of 31 ins. Special arms for larger or smaller diameters are available. The upender device is at present available for both gas and electric Clark fork-lift trucks of 2000-pound capacity.

HOISTRUX

NP19—The new Hoistrux, manufactured by Buffalo Hoistrux Co., is a portable lifting and moving device designed to handle almost any type of merchandise or equipment regardless of size or shape and weighing up to 2000 lbs. Constructed of heavy steel with all-welded joints, the unit incorporates the principle of the lever which enables one man



to lift and move up to 2000 lb. to a height of four ins. with a minimum of effort. It is stated that heavy-duty, hard rubber composition wheels or casters having a complete pivot action prevent scratched floors and facilitate travel. The portion of the frame which comes in contact with the load is padded with heavy sponge rubber. The units weigh 35 lb. each, and are 20" wide and 32" high. Handle length is 22 ins.; maximum lift, four ins.; depth, 10½".

CIRCLE NUMBERS ON THE CARD AND MAIL!

SAFETY RAMP

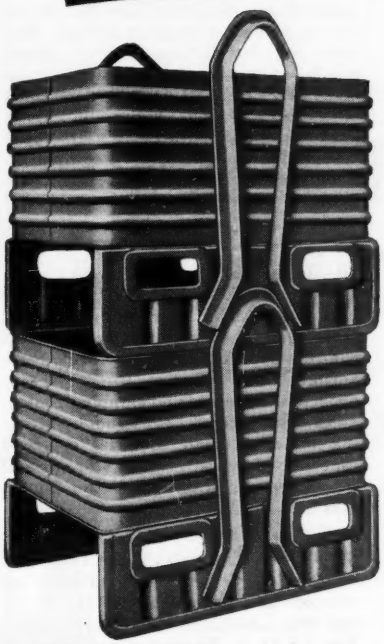
NP20—This Safety Ramp, developed by Barrett-Cravens Co., is designed to overcome differences between dock heights and the varying bed heights of trucks and trailers. This portable model, with its adjustable height feature, provides a gradual incline in a matter of seconds so that loading and unloading are done with ease, speed and safety. Other applications of the ramp include furnishing a gradual incline from shipping dock or truck bed to street level;

transferring loads from truck to truck or from freight car to truck; and bridging area-ways between buildings. A mechanical screw-type lifting gear provides a 12-in. variation in height at one end of the ramp. A few turns of the crank will bring that end of the ramp up or down as required. The 5' x 14' unit has a capacity of 6000 lb.

Better, Bigger Directory

New, improved features will be incorporated in the 1949-1950 FLOW Directory. More definitions and sketches; revisions for easier and more complete reference. Copies are $5.00 each.

STREATOR DEPENDABLE
Corrugated
Materials Handling Products



- ADDED STRENGTH
- LESS WEIGHT
- LOWER COST

CORRUGATED material handling equipment lasts longer and reduces maintenance and replacement costs. It is safer to use because it is stronger. The corrugations act as reinforcing ribs, more than doubling the strength and rigidity of the units—at the same time eliminating needless weight and bulk. The result is vastly improved handling equipment that takes more abuse, gives added years of service and COST LESS.

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- Rings
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- Special Equipment

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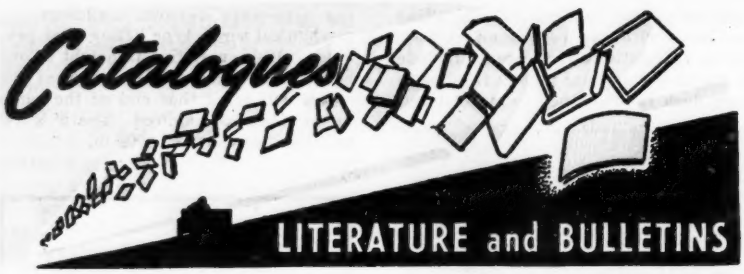


The publications featured on these pages were written by experts. They are FREE publications. To obtain these use the postcard bound into this issue.

25—Aerating Units . . . The Bin-Dicator Co. has announced two bulletins containing information and specifications on its new product, Bin-Flo Aerator Units. The equipment provides a simple means of injecting small volumes of low-pressure air into pulverized materials which tend to pack and do not flow readily from bins, hoppers and chutes. The unit consists of a small plate 3¾" x 7½" x ½" which is located at points where flow is restricted. The units will not plug up even with the most finely-ground material, it is said. One of the bulletins gives operational data including typical layouts, applications and air supply. The other bulletin stresses specifications.

26—Marking Equipment . . . An eight-page pamphlet is offered by the Industrial Marking Equipment Co. It describes the Auto-Printer, a unit designed for imprinting cartons, multiwall bags, wooden shooks, etc. A continuous traveling chain equipped with dogs pushes a container between printing rollers. The equipment is said to be able to print 2400 impressions per hour. Quickly insertable base-lock resilient rubber type is used. Side rails are adjustable to take various sizes of containers. The literature also includes photos and data on other equipment manufactured by the company, including smaller conveyor line markers and hand marking equipment.

27—Belt Conveyors . . . "Move More For Less" is the title of a 32-page belt conveyor bulletin released by Lippmann Engineering Works. Subjects covered include stationary, portable and 16 types of special-purpose belt conveyors, both troughed and flat. Included are applications and methods of selection of belt conveyors; dimensions, weights and specifications for standard head, tail and intermediate sections; lattice, channel and timber frames; and terminal machinery. Profusely illustrated.

28—Overhead Trolley Conveyor . . . A 98-page catalog is available from Mechanical Handling Systems, Inc., on its overhead trolley conveyor and component parts. Topics covered include chain, trolleys and wheels; I-beam track; drive units; sprockets and shear devices; and take-ups and roller turns. Additional pages discuss traction wheels, automatic oilers, hooks and carriers, guards and housings, automatic transfers and special equipment. The catalog contains installation photos and data of several case studies. A vast number of charts and engineering drawings of systems and components. Easily indexed for fast reference. The company is also offering bulletins on work carriers, racks, monorails, inter-floor conveyors, twin screw conveyors, belt conveyors, and floor conveyors.

29—Counting Devices . . . Available from the Durant Mfg. Co. are releases on new Productimeter counting device applications. One describes the Model H rotary counter on grass seeders. The other an installation of two Model 4-D-6-3 rotary counters on Alfa Cutting machines. Installations are described on the back of each photograph. These photos are designed to give users application ideas for this type of equipment. The company manufactures a wide range of counters for varied industrial uses.

30—Industrial Floor Products . . . The Camp Co. is offering literature on its line of industrial floor products. Subjects include plastic magnesium oxychloride flooring; floor resurfacer; Rubberlike Floor Runners for halls, approaches, elevators and shipping rooms; floor patch; grease-proof floor surfacing material; floor material designed especially for use in cold storage and freezer rooms. Many installation photos and data.

31—Shovel Cranes . . . The Link-Belt Speeder Corp. has issued catalogs on two of its models—the LS-71, ¾-yd. and the LS-51, ½-yd. shovel cranes. The LS-71 is illustrated as a shovel, crane, dragline and trench hoe. Charts and drawings show working ranges, lifting capacities and list dimensions, capacities and brief specifications. Model LS-51 is said to be the first ½-yd. shovel-crane equipped with full hydraulic controls. All welded lower frame, fully convertible for all front end attachments, independent chain crowd, independent boom hoist and many other features are photographically highlighted. Charts and engineering drawings are included.

32—General Handling Equipment . . . More than 50 pages of photos and descriptive matter on its line of material handling equipment are offered by Revolvator Co. Equipment covered includes portable and freight elevators, stackers and lifters, tiering machines, lift trucks, storage racks and elevating tables. One page gives factors to be considered in answering piling problems. In addition to general requirements, a section is devoted to recommendations on certain types of equipment which are keyed to main groupings in the catalog. Richly illustrated, the literature gives operating and in-

33—Floor Trucks . . . Floor trucks, wheels and casters are the subject of bulletins issued by the Nutting Truck and Caster Co. Many types are pictured and described. Included are two-wheel trucks; dolly trucks; wagon trucks, jacks and skids; bar handle trucks; stake and rack trucks; shelf and enclosed trucks; and special purpose units. The literature also stresses various types of wheels and casters. More than 100 photos augment descriptive material and detailed specifications. Other bulletins are designed specifically for the needs of certain industries, schools, colleges, hospitals and libraries.

34—Tackers . . . As a condensed edition of its catalog, the A. L. Hansen Mfg. Co. has issued a 24-page two-color booklet illustrating and describing its line of tackers, staplers and staples. Each page is a complete reference for the product shown, including description, uses and staple sizes. A summarized list of staples and sizes is printed in the back pages. Convenient pocket size.

35—Buckets and Grapples . . . The Owen Bucket Co. is offering a four-color, 26-page catalog on its line of buckets and grapples. Bucket features include balanced digging power; low center of gravity; adjustable undiminished power; lever type brackets; easy penetration and discharge; specially designed teeth; and speedy operation. Six types of buckets are pictured together with ratings, dimensions, weights and individual operating features. Bucket types include general purpose, light and extra light, and three and four-line and special purpose buckets. Several pages are devoted to attachments with dimensional drawings, photos and descriptive data. Another section contains information on grapples.

36—Material Handling Equipment for Railroads . . . George Haiss Mfg. Co., Inc., has released a four-page folder on its line of material handling equipment for the railroad industry. Models shown are belt conveyors, portable or stationary car unloaders, bucket loaders, crane buckets, ballast preparation plants, and truck-mounted conveyors. Richly illustrated. Each photo is accompanied with pertinent operating facts.

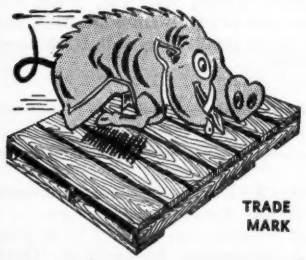
Thank You!

We have enjoyed the largest business in our history during the fiscal year just ended. We appreciate this confidence in RAZORBACK Brand Pallets by customers all over the United States.

We are installing new equipment to manufacture the best in pallets at a further saving to you. Order RAZORBACK Brand Pallets today and be certain of quality products, plus shipment when promised!

Arkansas Pallet Corp.

Plant and Sales Office in PINE BLUFF, ARKANSAS
P.O. Box 794-A Phone 6474



TRADE MARK

37—Belt Conveyors . . . Engineering Data Book ID-481, "Continental Belt Conveyors," is offered by the Industrial Division of the Continental Gin Co. Its 64 pages are filled with photos, engineering drawings, data and charts. Topics covered include idlers, rolls, trippers, brushes and scrapers, brakes, take-ups, pillow blocks, and pulleys. Additional pages cover belt conveyor design; eight drawings show typical conveyor installations. Pages are devoted to such topics as maximum lump size and idler spacing; speeds and capacities in tons per hour according to various materials; angle of inclination of a belt conveyor; maximum operating angles; horsepower to elevate and lower material; and horsepower to convey material horizontally.

38—Floor Surfacing Material . . . Ferem, a floor resurfacing material, is the subject of a folder released by the A. C. Horn Co., Inc. The product is said to be unusually resistant to wear, water and chemical disintegration. The material is designed for use on floors in receiving and shipping rooms, corridors and runways, loading platforms, etc. According to the literature, Ferem has a rating of nine in hardness on the Mohs scale, which is only one point less than the diamond. The folder contains directions for mixing, patching and resurfacing.

"DOUBLE-DUTY" with SPEEDWAYS Roller Conveyors

The "Hi-Lo" Feature is one of the plus values you get with Speedways Roller Conveyers. "Hi" side permits moving units wider than frame. With conveyor inverted to "Lo" side, frame acts as guard rail for units to be moved.

Easy portability, sturdy construction and simplicity of hook up that requires no tools are other features of both Speedways *Wheel* and SpeedTUBE *Roller* Conveyors. Available in 12", 15", and 18" standard widths, with wheel and roller spacing to meet your requirements, in 5' and 10' straight lengths and 45° and 90° curves, you can set up a material handling line to move your products. Write for literature and the name of your nearest Speedways representative.

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Stocked by experienced Materials Handling Engineers in principal cities. Also manufactured in Canada.

A 29 lb. Hand Truck with 1,000 lbs. Capacity!

Try *this* in your plant

★ LENGTH 53½"
★ WIDTH 22"
★ WEIGHT 29 LBS.
★ CAPACITY 1,000 LBS.
★ 8" DIA. BALL BEARING RUBBER TIRED MAGNESIUM WHEELS
★ TOW PLATE STEEL 22" x 6" OR 9" DEEP

Write for Complete Details

MAGCOA HAND TRUCKS

Made of Magnesium

Save time . . . save effort . . . save money in handling your materials with MAGCOA Hand Trucks. They're so light and durable you'll hardly believe it. You can lift the largest one easily with one hand . . . yet they feature rigid, durable strength greater than in much heavier steel trucks. Lightweight extruded tubular magnesium construction assures maximum safety in rugged, shock absorbent sturdiness. Available for smaller capacities, weighing 14 lbs. and 9 lbs.

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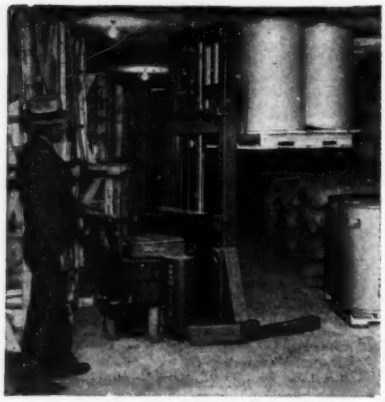
REVOLVATOR

GO-GETTER



Telescopic Straddle Type
Walk-Along Battery Liftruck

JUST FOUR OF MANY REASONS WHY—

1. **All controls at end of handle —no waste motion.**
2. **Controls operate in any position of spring balanced handle—greater maneuverability.**
3. **Positive spring-set deadman electric brake—perfect safety.**
4. **Seven inch traction surface at all times with articulated dual 12" wheel drive. Anti-friction bearings—greater ease and efficiency.**

Full details on all seven GO-GETTER models sent on request.

Made by the manufacturers of the famous REVOLVATOR PORTABLE ELEVATORS and RED GIANT HAND LIFTRUCKS.

Established 1904

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8739 Tonnele Ave., North Bergen, N. J.

Kindly send full information on GO-GETTER Power Liftrucks . . . Red Giant Hand Liftrucks . . . REVOLATOR Portable Elevators . . .

NAME .....

POSITION .....

COMPANY .....

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Men wanted Jobs wanted Lines available

Rates: for "Positions Wanted" $4.00 minimum, limit 25 words. For all other classifications $4.50 minimum for 25 words, each additional word 15c; boldface type or all capitals, $7.50 minimum for 25 words, each additional word 20c; limit 50 words. Box address count as five words. All insertions are payable in advance.
These classified columns are not intended for the advertising of new products by manufacturers, their representatives, or their distributors. These columns are limited to Help Wanted or Positions Wanted advertisements, and for the offering of used equipment by the users of such equipment.

FOR SALE

Hardwood Pallets
32"x40" (USED) **70c** EA.
SACRIFICE
Excellent Condition—Costs less than an Expendable Pallet—Worth more than twice as much.
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Wood Pallet Company, Inc.
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419 Boylston St., Boston Kenmore 6-8638

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IN THE PHILA. AREA

PORTABLE has the right material handling equipment for the right job! Leaders in equipment rentals, your requirements are sure to be found in our immense stock. Rentals can be made daily, weekly and yearly.

If you're in the market for re-built equipment, a card will bring our latest illustrated catalog. We handle the best machines available, and each is job-tested before it is sold, available for immediate delivery. See Portable for a lift!

Sales • Rentals • Service
PORTABLE SERVICE EQUIPMENT CO., Inc.
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EQUIPMENT FOR SALE

2000 lb. Truckman Low Lift Platform Truck. Briggs & Stratton Engine rebuilt. Price $225.00. Rankin Machinery Co. Inc. 1741 Columbus Ave., Sandusky, Ohio.

EQUIPMENT WANTED

WANTED: 45-ton Used Steam Locomotive Crane, give age, make, condition and price. Include location, length of boom and type of side frames.—Box 11549.

POSITION WANTED

FOR SALE: 10 years of diversified material handling experience by college-trained man in his thirties possessing exceptional background. Detailed synopsis sent upon request. Box 11349.

LINES WANTED

Fast growing, aggressive Fort Worth, Texas, Sales Organization wants to act as Manufacturers Agent on all types of Material Handling Equipment. J & L Supply & Equipment Co., P.O. Box 7124, Fort Worth, Texas.

Representative Northern Ohio wants additional account. Conveyors, monorail or specialty. Company must be established in territory or prepared to do promotion. Box 11449.

OFFICE FACILITIES

Are you interested in office space in Grand Central zone, New York City? Furnished private offices and secretarial service, etc., available for material handling organizations. Box 11149.

PERSONNEL WANTED

Opportunity to become part owner of sales organization, established twenty years—large Midwest city—exceptionally complete lines. Would prefer man around 35 years old, with electric storage battery experience—guaranteed income. Box 11249.

ON THE PALLET . . . .

(Continued from page 52)

angler's flies in place in the strongest breeze, yet they can easily be removed without damage to wings, hackles, or hooks. Designed and produced by General Electric Co. for the Charles F. Orvis Co. of Manchester, Vermont, distributors, the box is approximately 4" square—convenient for shirt or trouser pocket—and can hold 36 flies. It is constructed of durable translucent polystyrene, which permits the fisherman to see the flies without opening the box. A special snap-hinge either locks the top closed or holds it open. The magnet holding the flies in place rotates in either direction for quick and easy selection of a favorite fishing fly.

CHARLES SAWYER, Secretary of Commerce, will head a group of nationally prominent leaders of labor, management and government, who will tell the economic outlook during the 13th Annual Time and Motion Study Clinic to be held at the Sheraton Hotel, Chicago, November 2 through 4. The management clinic, sponsored by the Industrial Management Society, will bring together more than 4000 industrial executives, plant operators and supervisors who will discuss methods and means of winning the "Cold War" on Industrial Efficiency.

NORTHEASTERN UNIVERSITY, Boston, is conducting an evening course in material handling. It is scheduled as part of the program offered by the Evening Division of the School of Business. Similar courses have been given by Fenn College, Cleveland, Pennsylvania State College and the University of California.

THE American Management Association has announced the election and new appointment of officers and committee posts for the coming year. Newly elected officers include, Don G. Mitchell, chairman of the Executive Committee, who is president of Sylvania Electric Products, Inc.; James L. Madden, treasurer and chairman of the Finance Committee, who is second vice president, Metropolitan Life Insurance Co. Newly elected vice presidents of the association include, John S. Bugas, Grosvenor S. McKee, Frederick B. Heitkamp, John H. MacDonald, Russell B. Gallagher, and Harold V. Coes. The following were reelected: Chairman of the board, John M. Hancock; president, Lawrence A. Appley; honorary president, Alvin E. Dodd; secretary, James O. Rice; vice president, packaging division, J. D. Malcolmson; vice presidents at large, Keith S. McHugh and Erwin H. Schell.

IRONBOUND SKIDS

● Still the low cost time proven method for efficient and economical handling of materials.

IRONBOUND SEMI-LIVE SKIDS

● Semi-live skids can be made for use with box tops or trays to provide tiering, space-saving mobility. You can stack, tier or handle special materials with various types of superstructures.

We can show you how a semi-live material-handling system will work in your plant to save you money. Write for illustrated literature.

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● A sturdy economical truck available with single or double push handles. These trucks solve many inter-plant handling requirements. Write for literature.

RolTruk

THE IRONBOUND UNIT FOR SIMPLIFIED HANDLING OF PAPER ROLLS, DRUMS, BARRELS, REELS, KEGS, ETC.

● The Ironbound RolTruk will "pick-up and go" with cylindrical items weighing up to 2000 pounds. Available in models to meet most every roll handling requirement. Ask for special fully illustrated 6 page bulletin 10-RT.

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BOX & LUMBER COMPANY
Materials Handling Division
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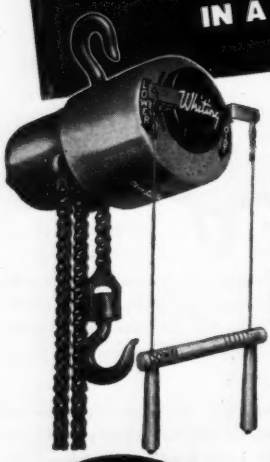
SKIDS • SEMI-LIVE SKIDS • DOLLIES • FLOOR TRUCKS

Here's a Hoist that...

PAYS FOR ITSELF IN A FEW MONTHS!



Even When Used Only a Few Minutes a Day

You can handle loads up to two tons 13 times as fast with a Whiting electric hoist as you can with a hand hoist . . . cutting down expensive, idle time of workers and machines.

Whiting hoists can be installed by one man, yet are so rugged they will stand up under heavy duty. The unique worm-gear drive provides smooth, silent power, and makes possible a hoist of amazing simplicity. Whiting hoists last longer because they have fewer wearing parts than any other electric chain hoist. Investigate their money-saving possibilities.

NOW NEW LOW PRICES $168.00 F O B HARVEY ILLINOIS and Up

WHITING

Builders of Cranes, Monorail Systems and **ELECTRIC HOISTS**

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☐ Send me a copy of your Bulletin H-100B.
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Literature Available From Advertisers In This Issue

(Check corresponding numbers on the enclosed card for the free literature listed below.)

A-1. HARNISCHFEGER CORP. will send Bulletin H20-4. It contains cost-saving ideas through the use of hoists.

A-2. FAULTLESS CASTER CORP. Catalog 156 contains photos and data on the company's line of casters.

A-3. AUTOMATIC TRANSPORTATION CO. Available literature describes features of its line of electric trucks.

A-4. ELWELL-PARKER ELECTRIC CO. "Industrial Logistics" is the title of a booklet on material handling problems.

A-5. GENERAL ELECTRIC CO. offers Bulletin GEA-5292 on G-E Sequency Charge Controls.

A-6. BRAINARD STEEL CO. The company's steel strapping system is the subject of literature available for distribution.

A-7. CURTIS MFG. CO. will send information on its air hoists, air cylinders and air compressors.

A-8. ELECTRIC STORAGE BATTERY CO. "Exide-Ironclad Topics" features case histories and latest developments in handling.

A-9. MERCURY MFG. CO. A 52-page catalog illustrates and describes the company's line of trucks.

A-10. ROTARY LIFT CO. offers information on Levelators, hydraulic truck ramps.

A-11. FAIRBANKS CO. Complete information is available on its line of two-wheel and four-wheel trucks.

A-12. MONROE AUTO EQUIPMENT CO. Literature describes its line of drop-bottom skid boxes, steel pallets and nesting rings.

A-13. FRANK G. HOUGH CO. will send catalogs on four sizes of Payloaders, powered scoop trucks.

A-14. C & D BATTERIES INC. Catalog IT-515 contains photos and data on its line of batteries.

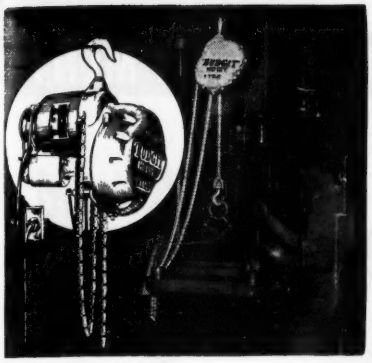
A-15. TOWMOTOR CORP. is offering a descriptive folder on its electric pallet trucks.

A-17. LEWIS-SHEPARD PRODUCTS INC. "Master Line" is the title of a bulletin on fork and platform trucks.

A-18. MECHANICAL HANDLING SYSTEMS. A catalog gives details on its portable twin screw conveyor for bags.

A-19. COLORADO FUEL AND IRON CORP. A brochure describes enclosed track, jib cranes, traveling cranes and monorails.

A-20. GLOBE HOIST CO. Bulletin F1149 shows typical installations of its lift bridges for spanning truck docks.



Downs high costs!

When 'Budgit' Electric Hoists were first offered to industry the savings were immediately apparent to purchasers. First was the incredibly low price! Then the hoists saved many minutes in every working hour.

Later, Management found that workers liked the hoists — they made the jobs much easier and protected workers against rupture, sprains and overtiredness from too much lifting. So production increased at much lower costs.

Savings today are much more vital, for all costs have gone up and now management *must* reduce them to make or increase profits.

There are no installation costs with 'Budgits'! Hang up, plug in and use! The first day they begin to make the savings that will pay for them over and over in their long troublefree life. Current consumption is trifling.

Install one now! It will prove to you the quick and continuous savings.

Made in sizes to lift 250, 500, 1000, 2000 and 4000 lbs. Prices start at $119. Write for Bulletin No. 391.

MAXWELL MM&M MANNING MAXWELL & MOORE INC. TRADE MARK

'BUDGIT' *Hoists*

MANNING, MAXWELL & MOORE, INC.
MUSKEGON, MICHIGAN

Builders of 'Shaw-Box' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' Industrial and 'Microsen' Electrical Instruments.

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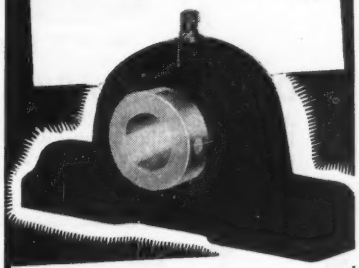
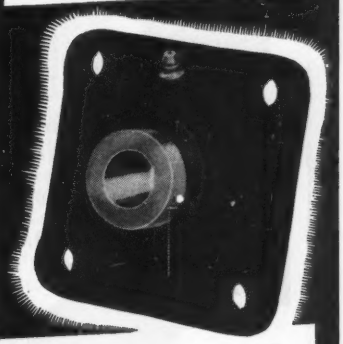
Lower Your Costs with

Roberts

BALL BEARING
PILLOW BLOCKS
AND
FLANGE UNITS



These bearings are machined, hardened and have unground raceways. The castings are accurately machined. They are designed to carry light loads at speeds up to 1,000 R. P. M. Heavy duty cast iron housings with grease fitting are provided. Felt seals give ample protection for the bearings.



Roberts Pillow Blocks and Flange Units may provide anti-friction bearings suitable for your application at lower cost. Ideal for conveyors and farm machinery.

Write today for catalog, engineering advice, and prices.

Territories open for agents, distributors and dealers.

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MACHINE WORKS

A DIVISION OF MINNESOTA BEARING CO.
1619 Hennepin Avenue
Minneapolis 3, Minnesota

PALMER-SHILE

MATERIALS HANDLING EQUIPMENT

Item B-731 $165.00

DRUM and BARREL TILT

A barrel tilt for controlled, precision dumping or pouring. Ideal for chemicals, solvents, powders, etc. Turns 360° through worm drive. Equipped with two safety type locking devices and all steel, welded yoke. Hand-operated chain drive.

Combination TRUCK and DRAIN RACK

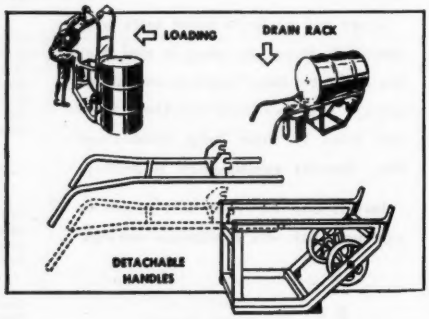
Loads Automatically

Weighs only 90 pounds, yet handles barrels weighing up to 1,000 lbs. with surprising ease. Sturdy frame, free rolling wheels and proper balance make light work of trucking the heaviest drums . . .

Tilt truck against drum, drop sliding steel grip over top of rim—rock truck back to wheeling position and loading is automatic.

To use as drain or storage rack detach handles to conserve floor space. Slight downward push on truck handles raises wheels and lays rack on floor in convenient draining position. One pair of handles will serve any number of trucks.

Heavy angle iron frame, tubular handles, all welded construction.



TWO STYLES

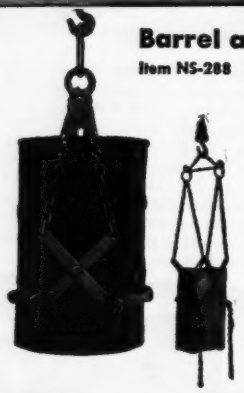
With and Without Detachable Handles

Item NS-506 (Handles welded to frame) $42.50
Item NS-506 DH (Truck Complete with detachable handles) 44.50
Item NS-506 R (Item NS-506 DH without handles) 32.50
Item NS-506 H (Detachable handles only, for use with NS-506 R) 12.00

Order by "Item" number. Prices F.O.B. Detroit. Weights approximate.

Barrel and Box Grab

Item NS-288 $55.25



For picking up any wood or steel barrel, box or container, 40" diameter or less. 2000 lb. capacity. Rigid toggle construction. Weighs 35 lbs.

Drum and Barrel Sling

Item B-205
$15.00

Handles barrels, drums, kegs—anything with a lip. Half ton capacity. Heavy welded chain and forged grab hooks. Weighs 8½ lbs.

Carboy Truck

Item B-488 M
$38.00
Item B-488 R
$42.00

Gripping yoke makes loading automatic. Hardened steel studs grip load—no slipping. All steel welded construction—20" wide, 48" in length—capacity 500 lbs. Wt. 75 lbs.

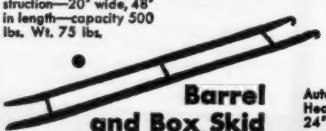
Barrel Truck

Item S-911-M
$33.50
(Metal Wheels)

Item S-911-R
$38.50
(Molded-on rubber wheels)

Automatically loads barrels up to 1,000 lbs. Heavy tubular welded construction—sliding grip. 24" wide—wt. 85 lbs.

Barrel and Box Skid



Light, sturdy, all steel welded construction. Handles heaviest barrel or box. 14" wide.

Item B-470-8 (8 feet) . . $22.00
Item B-470-10 (10 feet) 27.50
Item B-470-12 (12 feet) 33.00

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